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Catalog of wilderness: information and education techniques

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Catalog of Wilderness Information and Education Techniques

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Introduction

Developing wilderness information and education (I&E) programs that effectively reach out and communicate to backcountry visitors is a subtle, complex and challenging task. Designed to temper the social and visitor related resource impacts in the backcountry, I&E programs have been effective management tools in the preservation of Wilderness areas as places of solitude and freedom (Lime and Lucas, 1971; Fege and Corrigall, 1990).

Over several years, wilderness managers and information personnel have gained firsthand experience educating backcountry visitors and have learned the pros and cons of various I&E techniques. Many of the ideas and insights that managers have learned regarding the use of particular I&E techniques are transferable across and within the four federal agencies that manage designated Wilderness areas. The following catalog and research report are an attempt to capture the current knowledge of wilderness I&E and to provide the means for managers to communicate and exchange ideas on the wide range of techniques available for educating backcountry visitors.

Objective and Organization

This catalog of I&E techniques is designed to be used as a reference, once Wilderness managers have committed to developing an I&E program to help alleviate a specific management problem or group of problems related to recreational use. The catalog provides essential information for selecting the most effective I&E technique or group of techniques to use, based on the type and priority of the management problem, the financial resources and the available time and talent of agency personnel.

The catalog has been organized into two parts: Part I is an overview of the research used to gather the data for the catalog and Part II is the actual reference catalog of information and education techniques. Part I is set up similar to a technical research report with an introduction, a description of survey methods, a presentation and discussion of results, and finally, some conclusions derived from the research findings. Our reasons for supplying the details of the research were (1) to clarify where the information for the catalog came from and how it was gathered, and (2) to provide the manager with updated information relative to the popularity and effectiveness of specific I&E techniques and how they compare across the federal agencies managing Wilderness areas. The final section of Part I is a selection of recommended reading material that offers additional information about operating a successful I&E program and presents creative programs that have been used effectively in other Wilderness areas.

Part II, titled "Catalog of Wilderness Information & Education Techniques", begins with a brief review of the research project and then into an overview of some general I&E principles that should be followed when implementing an I&E technique, regardless of the specific management problem or educational goal. Principles such as keeping a professional attitude, using a mix of techniques when appropriate and carefully timing the delivery of an educational message are some examples. The General I&E Principles section should be read thoroughly before carrying out any I&E strategy.

The next two sections of the reference catalog evaluate the effectiveness, level of current use, annual cost range, required personnel time, advantages, disadvantages, production requirements, maintenance needs and operational tips for seventeen media-based and eight personnel-based I&E techniques. A summary of this information is presented in Table 1. These two sections provide essential information that will help determine the best technique to use and the most effective way of utilizing it to help alleviate a given management problem. Where they occur, the titles and sources of examples of existing I&E techniques that have proven successful in educating Wilderness visitors are listed after the technique evaluation.

A number of I&E techniques that are not widely used, but have been very effective in some Wilderness areas, are described in the next section titled "Innovative Information & Education Techniques". These techniques are good examples of the creativity often displayed by personnel responsible for Wilderness I&E programs. The final section of Part II, titled "Evaluating Information & Education Programs", discusses the need for periodic evaluation of I&E programs and briefly describes methods in which to perform an evaluation.

The most effective use of this catalog is to become familiar with its contents. Then decide which sections and techniques you are most interested in and that would be of most help, and concentrate on them. If time is limited and you are not interested in the research, concentrate on the I&E Catalog (Part II). If you are limited to reading about specific techniques, we strongly recommend that you read the General I&E Principles section, too. At some point, read through the Research Project (Part I). It presents information regarding the current status of Wilderness I&E efforts and will give managers the opportunity to evaluate their program relative to others across the federal agencies. Wilderness managers and field personnel who have few opportunities to exchange ideas with distant colleagues should find some useful hints and new ideas for using their I&E techniques.

Table 1. **Summary of Information & Education Technique Evaluations**

MEDIA-BASED TECHNIQUES	Current Usage	Personnel Time	Cost Range	Effectiveness of Technique
Commercial Periodicals	L	L	L	L-M
Agency Periodicals	L	L	L-M	L-M
Brochures	H	M	L-M	L-M
Maps	H	L-M	L-M	L-M
Posters	M	L	L	L-M
Signs	H	L-M	L-M	L-M
Guidebooks	L	L	L	L-M
Displays at Agency Offices	M	L	L	L-M
Displays at Visitor Centers	L	L	L-M	L-M
Displays at Trailheads	H	L-M	L-M	L-M
Movies	L	L	L	L-M
Videos	L	L	L	L-M
Commercial TV	R	L	L	L-M
Slide Shows	M	L-M	L-M	M
Commercial Radio	L	L	L	L
Agency Radio	R	L	L	L-M
Computers	L	L-M	L-H	L
PERSONNEL-BASED TECHNIQUES				
Personnel at				
Trailheads	M	M-H	M	M
Agency Offices	H	M-H	M-H	M
Visitor Centers	M	M-H	M-H	M
Campgrounds	M	M	L-M	M
Public Meetings	M	L-M	L-M	M
School Programs	M	L-M	L-M	M
Backcountry	H	M-H	M-H	M-H
Interpreters	L	M	L-M	M-H

R = Rare
L = Low
M = Moderate
H = High

See Media-based I&E Techniques section of catalog (page xx) for rating values.

Part I

Research on Wilderness Information & Education Techniques

Introduction

In 1981, the Appalachian Mountain Club Research Department, supported by the U.S. Forest Service, Northeastern Forest Experiment Station, published a report titled "Informing Backcountry Visitors: A Catalog of Techniques", by Martin and Taylor. The objectives of that report were to determine what information and education (I&E) techniques were currently being used by backcountry managers, to obtain the managers' evaluations of the effectiveness and efficiency of those techniques and to share the results with managers in the form of a reference catalog. The 1981 I&E Catalog was the first of its kind and was geared toward those who managed, supervised or conducted backcountry I&E programs.

A decade has past since research for the original report began. During that time, new technologies have evolved that could be applied to backcountry education, additional research has been conducted into the effectiveness of various techniques and backcountry managers have gained more experience using I&E techniques as recreation management tools.

The current research project was designed to update and revise the 1981 I&E Catalog. The major difference from the original report is that only managers and information personnel from the National Wilderness Preservation System were interviewed in this study. The specific research objectives are to determine what I&E techniques are being used by Wilderness managers today, to determine what administrative requirements they each possess and to obtain the managers' evaluation of the effectiveness of those techniques in helping to alleviate specific resource and social Wilderness management problems. The information generated by this research has been synthesized into a reference catalog (see Part II) for managers to use as a reference tool as they search for the most effective technique to inform and educate visitors of their Wilderness areas.

Survey Methods

Information for this catalog was collected between December 1989 and May 1990 using a written questionnaire and personal communication with agency personnel from the U.S. Forest Service (USFS), National Park Service (NPS), Bureau of Land Management (BLM) and U.S. Fish & Wildlife Service (FWS). The agency personnel that were contacted and that completed the questionnaire currently manage or assist in the operation of visitor information and education programs in federally designated Wilderness areas.

Written questionnaire

A written questionnaire (Appendix A) was mailed to 491 federal offices that manage at least a portion of one or more designated Wilderness areas throughout the United States. Questionnaire respondents held a variety of public service positions such as District Rangers, Public Information Officers, Park Superintendents, Interpreters, Naturalists, Wilderness and Trails Coordinators, Resource Management Specialists, Wildlife Refuge Managers, Recreation and Land Officers, Park Rangers, and Wilderness Specialists. They were each presented with a list of seventeen media-based and eight personnel-based I&E techniques, along with an optional "other" category. The primary purpose of the questionnaire was to learn what I&E techniques Wilderness managers currently use and for each technique, the managers' assessment of the techniques' effectiveness, annual cost and annual personnel time required to operate the technique. Respondents were also asked to relate the effectiveness of each I&E technique they currently use to alleviate specific management problems that exist in their Wilderness area, on a 1 (not effective) to 5 (highly effective) scale. Additionally, a series of comment questions requested information about available innovative I&E techniques and current research into the subject of I&E. The final two questions requested specific information about the respondent and their Wilderness area.

Follow-up Phone Interviews

Follow-up telephone interviews with selected respondents to the written questionnaire were done to obtain more detailed information about specific I&E techniques and programs. Respondents were selected based on their willingness to participate, the perceived quality of their programs and the types of techniques they used. The interview questions were designed to determine the advantages, disadvantages, production requirements, maintenance needs and general utilization tips for each I&E technique. Examples of interview questions are found in Appendix B. There was an additional series of questions designed to learn opinions and experience regarding the most effective ways to put together an overall I&E program.

Results and Discussion

Response to the Written Questionnaire

The written questionnaire was designed to obtain detailed information while at the same time, remain simple enough to be completed swiftly by busy professionals. Questionnaires were mailed to Wilderness management units within each federal agency that manage at least a portion of one or more Wilderness areas. The number of mailed questionnaires varied with the number of Wilderness management units for each agency.

The response rate of usable, completed questionnaires was 55% for the U.S. Forest Service, 54% for the National Park Service and 56% for the Bureau of Land Management (Table 2). A lower response rate for the U.S. Fish & Wildlife Service, 39%, was due to the comparatively lower recreational use in their Wilderness areas, requiring little or no I&E efforts.

Table 2. **Questionnaire Response Rate**

Response rate of federal agencies that completed and returned the written questionnaire.

Federal Agency	Questionnaires Mailed	Responses	Response Rate (%)
U.S. Forest Service	373	206	55
National Park Service	41	22	54
Bureau of Land Management	23	13	56
U.S. Fish & Wildlife Service	54	21	39
Agencies Combined	491	262	53

In all, we received and analyzed 262 questionnaires of the 491 that were mailed out to agency offices, resulting in a 53% overall response rate. Of the 262 responses, 206 (79%) were USFS, 22 (8%) were NPS, 13 (5%) were BLM and 21 (8%) were FWS. We conducted a follow-up phone survey of non-respondents to determine if their experience would change the results. The follow-up phone survey suggested that the information we received from the 262 respondents represented current Wilderness I&E practices and their evaluation.

Frequency of Information & Education Technique Use

The questionnaire asked respondents to indicate what techniques they currently used. Brochures turned out to be the most commonly used technique for informing and educating Wilderness visitors (Table 3). Close behind was the use of Personnel at Agency Offices, followed by Maps, Signs and Backcountry Personnel. At the bottom of the list were Commercial Radio and Television, Movies, Commercial Periodicals and Agency Radio.

The questionnaire and information analysis from the 1981 catalog were similar enough to this research to permit comparison of the results. It is interesting that the five most popular techniques in 1981 are still the top selections in 1991. Furthermore, the techniques are generally in the same range of percent use as they were ten years ago. One exception is the increased use of Personnel at School Programs (from 6% to 47%). Managers interviewed in the telephone survey felt that sending personnel to elementary, middle and high schools to present creative programs and seminars on such topics as backcountry safety, minimum impact camping techniques and Wilderness ethics is increasingly more popular among Wilderness managers.

Effectiveness of Information & Education Techniques

The questionnaire presented a list of ten common management problems associated with recreational use of Wilderness areas. We asked respondents to determine from the list, what problems they faced in their Wilderness area and then measure the effectiveness of the I&E technique(s) they use to help alleviate each problem, on a scale from 1 (not effective) to 5 (highly effective). The objective of this question was to rank I&E techniques as to their ability to deal with specific management problems. This helps the manager find the most effective I&E technique(s) to assist in alleviating a specific problem. The results of this question can be found in Table 4, where the average score of effectiveness for each I&E technique is listed under each management problem. For example, maps used for overcrowding has a score of 2.7, while maps used for trail deterioration has a score of 2.3. On average, the use of maps are better suited for resolving overcrowding problems rather than trail deterioration. Table 4 may be most helpful when a problem is known and the manager is searching for the most effective I&E technique to help alleviate the problem. For example, vandalism in Wilderness backcountry may be more effectively dealt with by personnel present at trailheads (score of 3.2) than with dispersal of brochures (score of 2.1).

The average scores for overall relative effectiveness of each technique are listed in Table 5. The most effective technique, for both the current survey and the 1981 survey, is the use of personnel in the backcountry. Managers are convinced that the most

effective way to inform and educate Wilderness visitors is in a one-on-one situation with an agency ranger or patroller in the backcountry. A study by Roggenbuck and Berrier (1982) found that backcountry ranger contact was more effective than a brochure alone in changing behavior among novice and mid-sized user groups.

Techniques utilizing personnel are rated above the media-based techniques, particularly those techniques that regularly require visitor contact and education, such as the use of interpreters and information personnel at trailheads and visitor centers. However, the combination of I&E techniques, whether media-based or personnel-based, can be even more effective than single techniques. For example, visitor use was effectively distributed in Yellowstone National Park by combining a brochure with a map designed to enable visitors to select trails offering the type of recreational experience they desired and to provide alternatives to the most highly used trails (Krumpe and Brown 1982). Roggenbuck and Berrier (1981) found that by distributing brochures alone at trailheads differed little in effectiveness of dispersing visitors than by distributing brochures through agency personnel at trailheads in the Shining Rock Wilderness. Hansen (1989) reports that traditional wilderness ranger education in the backcountry is more successful when proceeded by in-town or trailhead education.

In attempt to communicate with wilderness visitors before they head into the backcountry, locally and regionally produced slide shows have proven effective when shown to visitors at agency offices, visitor centers, special programs and in some cases, retail stores. before they head into the Wilderness. Slide show programs increased the knowledge of Rocky Mountain National Park visitors about wilderness management and use practices (Fazio 1979) and fire ecology in Grand Teton National Park (Nielson and Buchanan 1986). Information presented to individuals in a variety of situations can result in major shifts in knowledge levels and behavior (Dowell and McCool 1986).

The average scores for effectiveness for each I&E technique presented in this report are based on evaluations of effectiveness made by Wilderness managers responding to the questionnaire. Often, these evaluations are performed through visitor feedback, observations from field personnel and changes in resource conditions. Few managers design and implement research projects to generate objective information regarding the effectiveness of their I&E program in helping to alleviate management problems. Research that has been conducted into the effectiveness of various techniques in dealing with specific management problems in Wilderness areas and other backcountry recreational lands was incorporated where appropriate in this report.

Cost of Information & Education Techniques

We asked respondents to estimate the annual cost for each I&E technique that they used. The cost estimates given were grouped into three ranges, Low ($0-500/yr),

Moderate ($501-5,000/yr) and High ($5,000 +/yr). The percent of respondents whose estimate of cost fell within a particular cost range are listed in Table 6. An analysis by federal agency is presented in Appendix C. Differences between the four federal agencies are difficult to interpret due to the small sample sizes from three of the four agencies.

In general, the personnel-based I&E techniques cost considerably more than the media-based techniques. Personnel salary, depending on the number of staff and the amount of work time, is a major contributor to the cost of any technique. Managers encountered difficulty separating the cost of using a single technique from a total I&E budget because they rarely account for expenses in terms of individual techniques. Nearly every manager, some more than others, felt that the most limiting factor to the improvement and success of their I&E program is available funds. Much more work in Wilderness education could take place if the funding existed to hire education specialists and purchase materials necessary to implement the desired techniques.

Personnel Time

Respondents estimated the amount of personnel time that is required on an annual basis to operate each I&E technique they used. As expected, the personnel-based techniques require considerably more time from personnel than do the media-based techniques (Table 7, Appendix D). This finding is strongly correlated with the cost of personnel-based I&E techniques. Personnel-based techniques require a significant amount of staff time and salary to provide information to Wilderness visitors at such places as agency offices, trailheads and in the backcountry. Whereas, less staff time and funding is required to develop, for example, a brochure or a map to be disseminated as visitor information.

Follow-up Phone Interviews

We interviewed questionnaire respondents in order to determine the advantages, disadvantages, required maintenance and general utilization tips for each I&E technique presented in the questionnaire. Most of the respondents were willing to discuss their I&E efforts over the phone in greater detail than through the questionnaire. Through the interviews, we gathered practical information regarding the most effective ways of implementing specific techniques and putting together an overall I&E program. After speaking with 54 respondents, the comments became redundant and we stopped the interviews. All of the information has been summarized and incorporated into the General I&E Principles section of the catalog and within the specific descriptions of both the personnel-based and media-based I&E techniques.

Conclusions from the Research

1. With exception of the increased use of personnel at school programs, the relative frequency of use and effectiveness of both the media-based and the personnel-based I&E techniques have not changed over the past ten years.

2. Personnel-based I&E techniques are, on average, the most effective. However, they are also the most expensive and intensive to operate on an annual basis.

3. In general, managers find difficultly distinguishing the effectiveness of specific technique within an entire I&E program.

4. Insufficient funding is the most limiting factor as managers look to expand and improve their I&E program.

5. More research is needed on the effectiveness of both media and personnel based I&E techniques in helping to alleviate specific Wilderness management problems.

Recommended Reading

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Table 3. **Frequency of I&E Technique Use**

Number of Agency and percent of questionnaire respondents that currently use the I&E techniques 1990). Techniques are ranked from the most used to the least used. Percent use of similar I&E echniques in 1981 are from Martin and Taylor (1981).

I&E Technique	# of responses by technique in 1990 by Agency (total = 262)				Percent Use	
	BLM (13)	NPS (22)	USFWS (21)	USFS (206)	1990	1981
Brochures	10	16	17	152	74	80
Personnel at Agency Offices	8	11	9	155	70	72
Maps	10	10	13	144	68	73
Signs	6	10	14	145	67	69
Personnel in the Backcountry	6	15	6	142	65	51
Displays at Trailheads	4	6	7	127	55	11*
Displays at Agency Offices	4	7	7	108	48	11*
Personnel at School Programs	2	7	9	104	47	6
Posters	3	6	3	113	48	-
Slide Shows	7	8	9	71	36	47
Personnel at Public Meetings	6	6	8	70	34	38
Personnel at Campgrounds	2	6	0	83	35	47
Personnel at Trailheads	4	1	1	70	29	29
Personnel at Visitor Centers	5	15	7	42	26	48
Videos	1	6	3	44	21	-
Agency Periodicals	0	48	0	0	18	33*
Displays at Visitor Centers	1	10	5	30	18	11*
Guidebooks	0	2	3	29	13	35
Interpreters	2	6	3	18	11	5
Computers	1	2	3	22	11	-
Commercial Radio	0	1	3	20	9	25*
Commercial Periodicals	0	20	0	0	8	33*
Movies	0	1	2	16	7	18
Commercial Television	1	1	2	6	4	15
Agency Radio	0	1	1	1	1	25*

* I&E Techniques that were combined in the earlier report (Martin and Taylor, 1981) under general categories. The current report divides the same techniques into more specific categories (i.e. Radio is now gency and Commercial Radio; Displays are now Displays at Agency Offices, Trailheads and Visitor Centers; eriodicals are now Agency and Commercial Periodicals).

Tab **Effectiveness of I&E Technique by Management Problem**

Effectiveness of I&E techniques when used to help alleviate specific Wilderness management problems. Average ratings based on an effectiveness scale of 1 (not effective) to 5 (highly effective), provided by respondents for each technique they currently use.

	MANAGEMENT PROBLEM									
Media-based Technique	User conflict	Over-crowd	Trail Deterio-ation	Campsite Deterio-ation	Pack-stock damage	Human Waste	Water Contami-nation	Fish/ Wildlife impacts	Litter	Vandalism
Commercial Periodicals	2.5	2.3	2.2	2.6	2.2	2.4	2.3	2.5	2.8	2.4
Agency Periodicals	2.1	2.0	2.3	2.4	2.4	2.4	2.2	2.4	2.5	2.1
Brochures	2.4	2.4	2.4	2.6	2.7	2.9	2.5	2.6	2.8	2.1
Maps	2.5	2.7	2.1	2.0	1.9	1.9	1.7	2.2	2.0	1.6
Posters	2.2	1.9	2.3	2.6	2.4	2.4	2.2	2.5	2.7	2.1
Signs	2.3	2.2	2.4	2.6	2.4	2.2	2.1	2.6	2.5	2.1
Guidebooks	2.6	2.8	2.4	2.5	2.3	2.8	2.3	2.5	2.5	2.3
Displays at Trailheads	2.4	2.3	2.5	2.7	2.7	2.9	2.6	2.6	2.8	2.2
Displays at Agency Offices	2.1	2.1	2.1	2.3	2.3	2.5	2.3	2.6	2.6	2.2
Displays at Visitor Centers	2.0	2.5	2.0	2.5	2.0	2.5	2.0	2.5	2.5	2.0
Movies	2.4	2.4	2.4	2.9	2.4	2.6	2.4	3.5	2.8	2.5
Videos	2.6	2.3	2.7	2.9	2.6	2.8	2.3	2.9	2.8	2.4
Commercial TV	2.5	1.7	2.4	2.4	2.4	1.6	2.1	2.9	3.0	2.3
Slide Shows	2.8	2.9	2.9	3.2	2.9	2.9	2.6	3.0	3.2	2.8
Commercial Radio	2.3	2.2	1.6	1.8	1.8	1.5	1.3	1.7	2.2	2.1
Agency Radio	2.5	2.5	2.0	2.3	2.0	2.5	2.0	2.5	2.5	1.5
Computers	1.8	2.1	2.0	2.1	1.7	1.9	1.7	2.0	2.0	1.6

Tab continued for personnel-based I&E techniques):

Personnel-based Techniques	MANAGEMENT PROBLEM									
	User conflict	Over-crowd	Trail Deterio-ation	Campsite Deterio-ation	Pack-stock damage	Human Waste	Water Contami-nation	Fish/ Wildlife impacts	Litter	Vandalism
Personnel at Trailheads	3.5	3.6	3.3	3.4	3.3	3.3	2.9	3.0	3.5	3.2
Personnel at Agency Offices	3.2	3.3	2.6	2.6	2.5	2.7	2.5	2.9	2.7	2.3
Personnel at Visitor Centers	3.2	3.8	2.9	3.0	2.7	3.0	2.7	3.3	2.9	2.4
Personnel at Campgrounds	3.0	3.1	2.7	3.0	2.6	2.9	2.5	2.8	3.4	3.1
Personnel at Public Meetings	3.2	2.8	2.6	2.7	2.8	2.9	2.6	3.1	2.8	2.6
Personnel at School Programs	2.8	2.6	2.7	2.9	2.4	3.1	2.7	3.1	3.5	3.1
Personnel in the Backcountry	3.9	3.8	3.7	4.1	3.9	3.8	3.5	3.7	4.1	3.7
Interpreters	3.6	3.7	3.4	3.6	3.4	3.6	3.7	3.8	3.6	3.6

Table 5. **Overall Effectiveness of I&E Techniques**

Average scores of effectiveness based on a scale of 1 (not effective) to 5 (highly effective). Techniques are ranked from most effective to least effective.

I&E Technique	Average Score 1990	1980
Personnel in the Backcountry	3.8	4.0
Interpreters	3.6	3.6
Personnel at Trailheads	3.3	3.8
Personnel at Visitor Centers	3.0	3.6
Slide Shows	2.9	2.8
Personnel at Campgrounds	2.9	3.5
Personnel at School Programs	2.9	3.1
Personnel at Public Meetings	2.8	2.6
Personnel at Agency Offices	2.7	2.9
Movies	2.6	2.5
Videos	2.6	-
Displays at Trailheads	2.6	2.4
Brochures	2.5	2.6
Guidebooks	2.5	2.5
Displays at Visitor Centers	2.5	2.4
Commercial Periodicals	2.4	2.5
Agency Radio	2.4	2.4
Signs	2.3	2.6
Posters	2.3	-
Commercial TV	2.3	2.8
Displays at Agency Offices	2.3	2.4
Agency Periodicals	2.3	2.5
Maps	2.1	2.5
Computers	1.9	-
Commercial Radio	1.9	2.4
Weighted Overall Average	2.6	2.9
Average of Media-based Techniques	2.4	2.5
Average of Personnel-based Techniques	3.1	3.4

Table 6. **Annual Cost of I&E Techniques**

Percent of questionnaire respondents that estimated their annual cost per technique within the indicated range.

	Cost/yr (percent of respondents)		
	Low	Moderate	High
I&E Technique	**($0-500)**	**($501-5,000)**	**($5,000 +)**
Commercial Periodicals	90	10	0
Agency Periodicals	69	29	2
Brochures	73	24	3
Maps	68	29	3
Posters	81	19	0
Signs	57	51	3
Guidebooks	88	9	3
Displays at Trailheads	65	33	2
Displays at Agency Offices	86	12	2
Displays at Visitor Centers	72	28	0
Movies	84	16	0
Videos	81	17	2
Commercial TV	90	10	0
Slide Shows	76	23	1
Commercial Radio	92	8	0
Agency Radio	66	34	0
Computer	72	14	14
Personnel at Agency Offices	40	43	16
Personnel at Visitor Centers	27	42	30
Personnel at Trailheads	38	56	6
Personnel at Campgrounds	55	38	7
Personnel at Public Meetings	79	20	1
Personnel at School Programs	73	25	2
Personnel in the Backcountry	15	47	38
Interpreters	45	41	14

Table 7. **Annual Personnel Time**

Percent of questionnaire respondents that estimated the amount of time per year required to operate the I&E techniques within the indicated range.

	Person days/yr (percent of respondents)		
	Low	Moderate	High
I&E Technique	(1-10 days/yr)	(11-90 days/yr)	(90+ days/yr)
Commercial Periodicals	100	0	0
Agency Periodicals	92	6	2
Brochures	88	10	2
Maps	82	15	3
Posters	95	5	0
Signs	83	16	1
Guidebooks	94	3	3
Displays at Trailheads	88	11	1
Displays at Agency Offices	93	6	1
Displays at Visitor Centers	90	8	2
Movies	88	6	6
Videos	96	2	2
Commercial TV	100	0	0
Slide Show	85	14	1
Commercial Radio	91	9	0
Agency Radio	100	0	0
Computer	75	14	11
Personnel at Agency Offices	55	34	11
Personnel at Visitor Centers	42	23	35
Personnel at Trailheads	54	38	8
Personnel at Campgrounds	57	24	9
Personnel at Public Meetings	87	12	1
Personnel at School Programs	85	14	1
Personnel in the Backcountry	22	45	32
Interpreters	52	29	19

Part II

Catalog of Wilderness Information & Education Techniques

Design in Brief

This catalog represents an update of the 1981 report published by the Appalachian Mountain Club titled "Informing Backcountry Visitors: A Catalog of Techniques", by Martin and Taylor. The research objectives, design and format of this catalog are modelled after the earlier report. The major difference is that the current report gathered information only from agency personnel within the National Wilderness Preservation System, whereas the 1981 report was more broad in scope.

Two methods were used to gather information on the range of I&E techniques currently used by Wilderness managers. First, a written questionnaire was mailed out to Wilderness managers in the U.S. Forest Service, National Park Service, Bureau of Land Management and the U.S. Fish & Wildlife Service. Managers were asked to indicate what I&E techniques they are currently using, estimate the cost of those techniques and the required personnel time to operate each technique, and rate the effectiveness of each technique they use for dealing with specific management problems within their Wilderness area.

Secondly, we conducted follow-up phone interviews with a subset of questionnaire respondents. Detailed questions were asked regarding the advantages, disadvantages, production requirements, maintenance needs and general utilization tips for each I&E technique used. The information gathered from these two methods, along with relevant comments from the earlier report, were compiled for this I&E Catalog.

General Information & Education Principles

Certain principles were expressed repeatedly by managers when describing the best approach to using specific I&E techniques. These principles have been summarized in the following section and should be understood and kept in mind whenever a technique is implemented.

Professionalism

Probably the most important principle is the use of a professional approach with all I&E techniques. The purpose of using a technique must be well defined and a plan for implementing its use is essential. The text or dialogue should be accurate, concise and

easy to understand and all aspects of production should use skilled personnel with high quality equipment and materials. I&E materials do not need to be slick, but if they are too amateurish they may be ignored by most visitors. The benefit of a well developed and operating I&E technique is worth the initial moderate to high cost for professionalism.

Personnel

Full-time and seasonal personnel that serve as an information interface with the public should have personality traits that enable them to interact with the public effectively. These traits include a cheerful, out-going and positive attitude. The ability to speak well, give accurate directions and read a map are helpful as is the ability to listen and gauge visitors' experience in the backcountry. Personnel should be hired only after an interview, either by phone or in person, since written applications and computerized ratings provide little indication of how a person reacts to others.

Most of all, personnel should be well trained in their role of providing information to visitors. They should be knowledgeable of the natural and cultural history of their Wilderness and comfortable approaching people in a polite manor. They should be familiar with minimum impact camping techniques and Wilderness regulations and be able to give or refer visitors to essential information that they are unable to provide. A training program should proceed the employment period with occasional day sessions during the season to evaluate and update performance.

Combination of Techniques

Wilderness managers were generally of the opinion that a combination of I&E techniques is the most effective way to express a message to visitors. Use of multiple techniques allows for reinforcement of messages through repetition and is more likely to reach a larger audience. However, care must be taken not to overload visitors with information, because too much may cause boredom and rejection (Roggenbuck and Manfredo 1989).

I&E Message

The I&E message content should vary depending on the management problem of concern and the perceived need to educate actual and potential visitors about Wilderness values. Message content can include, but not be limited to, minimum impact camping techniques, backcountry safety, trail and campsite conditions, natural and cultural history, management regulations and general Wilderness values. Regardless of content, the message should be clear, concise and simple (Hunt and Brown 1971).

When more than one technique is used or personnel are directly involved, message consistency is essential. Otherwise, visitors can easily become confused and may lose

confidence in management policies. Unless sufficient time is available for visitors to read, think and absorb in-depth messages, avoid using extensive amounts of text. Visitors tend to ignore "wordy" signs or displays. Messages should be positive, friendly and informative, not negative and full of "no's" and "do not's". The negative approach is often obtrusive to the visitor's experience and the message is ignored.

Timing of I&E Message

The timing of any I&E message delivery is critically important to learning (Roggenbuck and Manfredo 1989) by the Wilderness visitor. Maximize the effectiveness of a message by carefully timing its delivery before, during or after the visitor enters the Wilderness. For example, locating information encouraging the use of backpacking stoves to minimize campsite deterioration at the Wilderness trailhead or in the backcountry is too late in the visitor's trip planning process. Determine when the technique will be most effective in relaying a message. The amount of time a visitor is willing to spend absorbing the message will also determine the probability of encouraging or modifying behavior.

Targeting the I&E Message

Visitor characteristics such as extent of backcountry experience, level of education and location of residence should be understood to help target the I&E message. In addition, surveying Wilderness visitors to determine where they seek information will enable the manager to insure that good information is available at those sources.
Less experienced Wilderness visitors are typically more open to learning recommended ways of camping in the backcountry then more experienced ones (Fazio 1979). Studies have shown (Dolson 1990) that large federal lands can receive greater than 50% first time visitors each year. This type of information can help shape I&E messages, the timing and the techniques of an I&E program. A simple survey to learn the visitor characteristics of your Wilderness area can be very useful in the design of an I&E program.

Overcoming Budget Constraints

Nearly all the respondents voiced a "lack of sufficient money" as the primary limiting factor in their I&E program. Although this is a real problem, creative thinking can reduce the restrictions brought on by limited budgets. If trained and supervised properly, volunteers can carry a great deal of responsibility, particularly during high use periods. College students and school teachers are good volunteer sources that enjoy teaching environmental programs (Hansen 1989). Volunteers can accomplish grade school education, visitor group education and trailhead education. Be sure to carefully interview a potential volunteer. They can require too much time and effort and become more of a problem than assistance, if not qualified to handle responsibility.

By fostering interpretive non-profits, matching funds or educational grants from private foundations can be developed. Working partnerships with existing non-profit recreation organizations and with managers of other Wilderness areas have been very successful. Re-evaluate your current I&E program to be sure its cost effectiveness is maximized.

Commitment

Finally, educating people about the wise use of Wilderness backcountry requires agency personnel that believe in education as an effective management tool. A Wilderness manager must make a commitment with educational directives to maximize the effectiveness of each I&E technique used, as it fits into an overall Wilderness Management Program.

Media-based I&E Techniques

Media-based techniques are communication avenues in which pre-prepared or mass distributed materials provide the majority of information to the Wilderness visitor, such as brochures, maps, guidebooks, displays, etc. This section provides a detailed description for each of the 17 media-based I&E techniques presented in the written questionnaire. The following categories are used to provide descriptive and quantitative information that will assist a Wilderness manager in deciding which technique would best fit into their management plan.

Description is a general overview of what the technique is and how and where it is commonly used.

Effectiveness is the Wilderness managers' perception of how effective each technique is in modifying or encouraging visitor behavior in the backcountry. The value used to rate effectiveness is the weighted average of effectiveness values from Table 4 as each technique relates to a specific management problem. The ratings are based on the following scale: $\leq$1.8 is Low; >1.8 but $\leq$2.6 is Low to Moderate; >2.6 but $\leq$3.4 is Moderate; >3.4 but $\leq$4.2 is Moderate to High; and >4.2 is High. This category also describes the effectiveness of the particular technique in dealing with specific Wilderness management problems.

Certain I&E techniques are particularly effective in dealing with specific management problems. For example, movies are moderately to highly effective in alleviating fish/wildlife impacts and low to moderately effective in dealing with other problems such as overcrowding and human waste. A summary of how the various I&E techniques relate to specific management problems can be found in Table 4.

Current Usage is the amount of use the technique received at the time of questionnaire distribution. The value used to rate current usage is the average of annual percent use per technique. The ratings are based on the following scale: <5%/yr is Rare; 5-30%/yr is Low; 31-70%/yr is Moderate; and >70%/yr is High.

Cost Range is the average annual cost for producing and operating an I&E technique. The ratings are based on the following scale: $0-$500/yr is Low; $501-$5,000/yr is Moderate; and $5,000 +/yr is High.

Personnel Time is the amount of time management personnel spend per year operating and maintaining the technique. The ratings are based on the following scale: 0-10 days/yr is Low; 11-90 days/yr is Moderate; and >90 days/yr is High.

Advantages and **Disadvantages** are the positive and negative aspects of operating the I&E technique.

Production discusses the skills that are needed to develop and use each technique as well as describes the general process needed to make the technique effective.

Maintenance refers to the resource level required to clean, repair and replace equipment and materials in order to keep the technique operational.

Tips are general comments for the most successful use of the I&E technique of concern. These comments supplement the General I&E Principles section of the report.

Available (technique) is/are examples of currently available material for the technique of concern and a source to obtain a sample. This list is not exhaustive, it is intended to provide information that can be adopted into an I&E program and to stimulate ideas for creating site-specific techniques.

Very likely, alternative I&E techniques and programs that have proven successful in Wilderness areas or other backcountry recreation lands were missed in this report because of the scope of the research project. The list of techniques and their evaluation in the catalog should not be treated as exhaustive.

Commercial Periodicals

MEDIA-BASED TECHNIQUE

DESCRIPTION	Feature articles or information columns published in local, regional and national magazines and newspapers that address many Wilderness topics. Often, messages are worked subtlety into an article that may not be directly related to the articles' main subject, but are significant to Wilderness.
EFFECTIVENESS	Low to moderate. Articles in commercial periodicals describing minimum impact camping techniques have been moderately effective in decreasing campsite deterioration, improper disposal of human waste, vandalism and most of all, litter. Well written and widely distributed feature articles describing the natural history and behavior patterns of fish and wildlife have helped reduce visitor impacts on their populations in Wilderness areas. Feedback from Wilderness visitors that have read an article and through field observations are ways in which managers evaluate the effectiveness of commercial periodicals.
CURRENT USAGE	Low.
COST RANGE	Low. If the article is written in-house, the only cost would be salary time. Typically, there is no cost for submitting an article to a newspaper nor to a magazine.
PERSONNEL TIME	Low. The amount of time required to get an article published depends on the time spent researching and writing and the quality of the article.
ADVANTAGES	The articles reach people before their visit to a Wilderness area, during the planning stages of their trip. Mass distribution with consistent, detailed information occurs. Article may reach the backcountry visitor who never stops at visitor centers or agency offices.
DISADVANTAGES	Messages from the articles may be forgotten or ignored. An article may miss the target audience. No real opportunity after the article is read for questions and feedback. Messages in articles may not leave a lasting impression on the reader.
PRODUCTION	Personnel with a special interest in a subject and good writing skills may write an article in-house for submission to magazines and newspapers. The other option is to supply information to a qualified journalist for submission. Managers may choose to write a press release to announce a special event or occasion and send it to local and regional newspapers. Managers target audiences, once they know who they are and where they can be reached, by submitting articles to magazines and newspapers in their area of residence.
MAINTENANCE	Not applicable.
TIPS	Determine who your audience is and where they reside, especially those that are known to cause problems and target those areas. Make the article and its message interesting, to keep the readers' attention. Use high quality photographs when available to enhance the message. When the article is released, copy and post it at areas where visitors may take time to read and think about the topic. Try to coordinate articles with television and radio coverage.

Agency Periodicals

MEDIA-BASED TECHNIQUE

DESCRIPTION	Feature articles or information columns written in periodical newsletters published by visitor centers and agency offices. Alternatively, central agency offices may publish newsletters containing articles that could be applied to specific management needs at Wilderness areas.
EFFECTIVENESS	Low to moderate. Articles and announcements in agency periodicals that address proper minimum impact camping techniques are effective in decreasing amounts of litter, packstock damage, campsite deterioration and improper disposal of human waste in Wilderness areas. Articles that describe ways of preventing impacts to fish and wildlife are effective when published in agency periodicals. Feedback from Wilderness visitors that have read an article in an agency periodical and through field observations are ways in which managers evaluate the effectiveness of agency periodicals.
CURRENT USAGE	Low.
COST RANGE	Low to moderate. The cost of agency periodicals includes the salary time required to research and write the articles, layout and print the publication, and distribute the final copies where necessary. Printing and distributing in bulk decreases the cost per copy of the periodicals. Cooperate with a central office or other agency offices to limit printing costs.
PERSONNEL TIME	Low. Most of the personnel time is used up in researching and writing the articles and laying out and printing the publication.
ADVANTAGES	Control over location and timing of distribution. Articles can address Wilderness topics of concern as needed and on a site-specific basis throughout the year. Periodicals can be included in any package of material that is sent out to potential and past Wilderness visitors. Chance for feedback and questions if visitor reads periodical near or at visitor centers and agency offices.
DISADVANTAGES	Requires facility and equipment for production. Message from the article may be forgotten or ignored. The article may miss the target audience. Message in the article may not leave a lasting impression.
PRODUCTION	Personnel with good writing skills and layout creativity may publish agency periodicals. Articles can be submitted by personnel in the agency familiar with a specific topic or information could be gathered and the article written by one or two personnel assigned to the production of the periodical. Managers distribute the periodicals to target audiences, once they know who they are and where they can be reached.
MAINTENANCE	Periodic cleaning and repairing of printing equipment.

TIPS

Customize and layout articles to make the publication readable and interesting. Use high quality photographs and illustrations where appropriate to enhance the message. Distribute to potential and past visitors by mail or at visitor centers, agency offices and local retail stores. Make sure where the periodical is distributed that readers have enough time to think about the message before they need to change their behavior. Determine who your audience is, especially those that are known to cause problems, and target the areas where they make contact to get information for the Wilderness.

Brochures

MEDIA-BASED TECHNIQUE

DESCRIPTION	Portable folded page or small booklet with text and illustrations that address specific Wilderness topics. Brochures are usually free of charge and are distributed to visitors before their trip into the Wilderness at agency offices, visitor centers, trailheads and in pre-trip information packages.
EFFECTIVENESS	Low to moderate. Brochures that address minimum impact camping techniques have been effective in decreasing improper disposal of human waste, packstock damage and campsite deterioration. Brochures have also been used effectively to decrease litter. Managers say the effectiveness of a brochure increases if handed out to a visitor to complement a one-on-one discussion regarding a particular topic. Brochures are a good opportunity to describe "step by step" procedures for minimum impact camping, travel safety precautions and explaining management objectives.
CURRENT USAGE	High. Brochures are the most used media-based I&E technique and only second overall to personnel at agency offices. Some managers expressed concern that brochures are used too frequently and that brochures' potential effectiveness in dealing with a problem be carefully weighed against alternative techniques.
COST RANGE	Low to moderate. Per copy, brochures are relatively inexpensive. However, large printings can cost in the thousands of dollars with cost per copy decreasing as quantity increases. Costs also include personnel salary time to develop and produce the brochure and any services from professional layout or printing artists.
PERSONNEL TIME	Moderate. Most of the personnel time required to produce a brochure is invested into developing the text, illustrations, and layout. The least amount of time is tied up reviewing drafts and approving proofs before the final printing.
ADVANTAGES	Consistent information available before, during and after a Wilderness visit. Can be mass distributed to a wide range of visitors or targeted towards a specific user group. Brochures are portable in a pocket or pack and can cover a wide variety of Wilderness subjects.
DISADVANTAGES	Uninteresting or displeasing brochures often become trailside litter. Many people will take brochures if distributed, but may not read them or ignore their advice if they do. A brochure designed to address a specific subject can become insignificant when distributed with a series of other brochures. The subject of the brochure may not be understood and no immediate feedback mechanism exists to explain the brochure.
PRODUCTION	Most work for a brochure is performed in-house. Information personnel and managers usually establish the topic and develop the text. Design and layout, the next step, may be done in-house, at a regional or central office, or commercially. Printing can be done commercially or by an agency printing office. The personnel developing the brochure should have good writing and design skills as well as knowledge of the topic.
MAINTENANCE	Periodic updating and reprinting.

TIPS

Be sure that a brochure is the best technique for conveying the message you have defined. If it is, look at other brochures to get ideas for text, illustrations and layout. The text should be concise and the message simple. The more text, the more likely a visitor will put the brochure away to read at a later time. Allow managers, including field personnel, to review the text, especially if the brochure is intended to convey information that visitors may not seek themselves, such as regulations. The brochure should be graphically attractive, with open space and illustrations breaking up the blocks of text. Unless the equipment and talent is available in-house, go to a professional graphics artist for the final layout and printing. Print in bulk to reduce costs. Brochures can be included with backcountry permit information packets. Consider developing or using existing interagency brochures that communicate the same message before using resources on a new one.

AVAILABLE BROCHURES

An Enduring Resource of Wilderness
USFS, Washington Office, Recreation Management Staff
P.O. Box 96090, Washington, DC 20090

Leave No Trace Land Ethics
Southwestern Region, Federal Building
517 Gold Ave. SW, Albuquerque, NM 87102

Without a Trace: The Wilderness Challenge
USFS, Pacific Northwest Region
319 SW Pine St., Portland, OR 97208

Maps

MEDIA-BASED TECHNIQUE

DESCRIPTION	Folded paper or plastic coated maps with detailed topographic features of Wilderness area. Trail information, campsite locations and regulatory zones are commonly included on the maps. Messages can be printed on the reverse side, such as minimum impact camping techniques and safety precautions. Permanent, weather resistant maps that show Wilderness information can be posted at trailhead displays and Kiosks. Maps are made available for visitors at agency offices, visitor centers and equipment stores ranging in price from free to several dollars.
EFFECTIVENESS	Low to Moderate. Maps are most effective in dealing with overcrowding problems and user conflict. Maps have been used effectively to disperse use throughout a Wilderness area.
CURRENT USAGE	High. Nearly every manager hands out or sells portable maps and refers to permanently displayed maps in an office or at the trailhead.
COST RANGE	Low to moderate. The largest expense for producing a map is printing costs, with graphics and layout representing a smaller portion. Selling maps to visitors can help offset printing costs. If developed in-house, personnel salary time will be an expense. Periodic updating will incur a cost.
PERSONNEL TIME	Low to moderate. If the map is produced in-house, agency personnel will spend time defining messages and points of concern. Additional time is required to layout the map and review proofs before the final printing. Initial development of a map can take up to one year.
ADVANTAGES	Useful before and during trips in the backcountry. If taken into the backcountry, maps can reinforce messages presented before the trip. Mass distribution at low cost occurs. Visitors find maps necessary and are willing to purchase them. Maps are portable in a pack or pocket.
DISADVANTAGES	Not every visitor can interpret a map. Space is limited on the front and messages on the reverse side are often ignored by visitors. Maps typically lack a personal touch.
PRODUCTION	Existing maps should be reviewed for accuracy and quality. Producing a new map requires skilled personnel and field staff that can take a high quality topographic map base, aerial photographs and field checks to locate and identify map features, such as trails, boundaries, and designated campsites. Commercial cartographers or central agency offices are usually required to produce the final draft and print the copies.
MAINTENANCE	Periodic review and updating to insure accuracy of maps.

TIPS

Accuracy and clarity of trail information, campsite locations and regulatory zones relative to the topographic features are important. Use a high quality topographic map. If possible, briefly interpret the map to a visitor when they receive it. Print a large supply, once the final version has been developed. Often, maps can be used as an effective supplement to guidebooks. Providing basic maps with specific trail information, campsite locations and regulatory zones of Wilderness via mail to potential visitors helps them plan their trip. Produce latex-coated maps in damp climates to make them last longer.

Posters

MEDIA-BASED TECHNIQUE

DESCRIPTION	Single sheet information posters ranging in size from legal letter (8.5"x11") to fairly large (18"x20"). Posters can be designed to express any topic by using one to five simple messages pertaining to regulated and recommended practices in Wilderness areas. Posters are put up at places were Wilderness visitors are likely to search for or receive information such as trailheads, campgrounds, agency offices, visitor centers and in town at equipment stores.
EFFECTIVENESS	Low to moderate. Information posters that explain proper minimum impact camping techniques have been moderately effective in decreasing campsite deterioration, improper disposal of human waste and packstock damage. Posters have been particularly effective in reminding visitors not to litter by promoting the "carry-in/carry-out" campaign.
CURRENT USAGE	Moderate.
COST RANGE	Low. The cost of producing a poster is tied up in the personnel salary time required to write the text, layout the graphics and post the final product. Printing is done commercially or by a central office.
PERSONNEL TIME	Low. Most of the personnel time required to produce a poster is invested into developing the text, illustrations, and layout. The least amount of time is tied up reviewing drafts and approving proofs before the final printing. Personnel time will vary depending on the talent of the staff to complete these tasks.
ADVANTAGES	Consistent information. Simple and attractive messages that reach visitors at a variety of places before entering the Wilderness, such as trailheads, agency offices, visitor centers and in-town equipment stores. Posters are easy to distribute and post. Generic posters exist at central offices that can be adapted to most Wilderness areas.
DISADVANTAGES	Poster may be missed by visitor. Too many posters at one location inhibits the delivery of a single message.
PRODUCTION	Posters are usually produced in-house or at central agency offices. Information personnel and managers usually establish the topic and develop the text. Design and layout, the next step, may be done in-house, at a regional or central office, or commercially. Printing can be done commercially or by an agency printing office. The personnel developing the poster should have good writing and design skills as well as knowledge of the topic.
MAINTENANCE	Periodic updating, reprinting and replacing.

TIPS

Construct posters from durable waterproof material, such as Lexan. Use pictures or illustrations that break up the text and enhance the message and attractiveness of the poster. The text should be concise and the message simple. The more text, the less likely a visitor will read the poster. Allow managers and field personnel review the text, especially if the poster is intended to convey information that visitors may not seek themselves, such as regulations. Unless the equipment and talent is available in-house, go to a professional graphics artist for the final layout and printing. Avoid posting with staples that rust or tear poster due to weathering. Mail posters to schools, colleges, equipment stores or any place where you can reach visitors, and request that they be posted.

AVAILABLE POSTERS

Leave No Trace of Your Passing
Southwestern Region, Federal Building
517 Gold Ave., Albuquerque, NM 87102

Minimum Impact Camping
Recreation Equipment Inc.
P.O. Box C-88126, Seattle, WA 98188

Step by Step for Better Trails
Deschutes National Forest
P.O. Bow 3623, Portland, OR 97208

Signs

MEDIA-BASED TECHNIQUE

DESCRIPTION	This technique refers to traditional signs, made of wood, metal, fiberglass or plastic, that provide on-site information to visitors in the backcountry or at Wilderness trailheads. Sign messages are brief and are written to reinforce regulations and proper use techniques at special interest areas (i.e. revegetation areas, designated campsites, etc...) and provide local trail route information.
EFFECTIVENESS	Low to moderate. Signs have been moderately effective in minimizing campsite and trail deterioration, packstock damage and litter. A creative way of using signs is to space them along Wilderness access trails to remind visitors of specific Wilderness ethics such as camp away from water, carry-in/carry-out, use portable stoves, etc. Identifying or using signs to "herd" visitors away from sensitive areas has decreased impacts to fish and wildlife.
CURRENT USAGE	High.
COST RANGE	Low to moderate. Initial cost of materials and personnel time required to construct the signs is the most cost. Long-term maintenance depends on structural composition and design of the signs and can be moderate if poorly built.
PERSONNEL TIME	Low to moderate. If sign system is extensive, most personnel time will be put into patrolling, upgrading and replacing the signs. Often this task is completed by field personnel.
ADVANTAGES	On-site messages that can reinforce regulations and proper use techniques at special areas of interest and trailheads. Directs visitors along desired camping route and to destination in the backcountry. Cautions use of dangerous and sensitive areas. If constructed and maintained properly, can be a relatively long-term information source.
DISADVANTAGES	Subject to varying degrees of weathering, animal destruction, vandalism and theft. Limited information space. Can be viewed as obtrusive in a Wilderness setting, removing the sense of independence and self-reliance. If sign system is extensive, can require regular patrol and maintenance.
PRODUCTION	Construct signs from materials such as wood, metal, plastic or fiberglass, in a fashion that can withstand damage for a prolonged period of time and is aesthetically appropriate. Thorough consideration of potential damage, during construction, will minimize overall maintenance. Managers should work with field personnel to determine at what sites to post signs and what message each one should have. Agencies may have guidelines for the layout of signs. Much of the construction work can be completed in-house if the equipment is available and if personnel are handy with wood working tools. Local commercial sign shops could be contracted to make the signs, once the layout has been finalized.
MAINTENANCE	The degree of maintenance depends on the type of material used to construct the signs and structural design and nature of the sign system. Basic maintenance procedure is to patrol sign system to document condition of signs and accuracy of information. Some signs may need reconstruction or some touch-up work.

TIPS

Keep the sign message short and simple so the visitor will read and not ignore it because of text length. If equipment and personnel skill is available, construct signs in-house to reduce cost. Design a regularly scheduled patrol program to document condition of signs. Limit obtrusiveness by using colors that blend in with the surrounding environment. A computerized inventory of signs can assist in a structured sign maintenance program. Positive phrasing is more effective than negative (i.e. "camping allowed within designated areas" rather than "no camping outside of designated areas"). Strike a friendly tone.

Guidebooks

MEDIA-BASED TECHNIQUE

DESCRIPTION	Pocket sized book or pamphlet, primarily designed to assist the Wilderness visitor in determining a travel route. Guidebooks contain detailed information about the Wilderness backcountry trail system, designated campsite locations, regulatory zones and topographic features. Additional information, such as natural and cultural history, safety precautions, minimum impact camping techniques and other management topics can be included.
EFFECTIVENESS	Low to moderate. By making visitors aware of alternative travel routes and camping areas, guidebooks have been effective in minimizing overcrowding and user conflicts. Guidebooks provide a medium to explain minimum impact camping techniques and have proven moderately effective in decreasing campsite and trail deterioration, improper disposal of human waste human waste and litter. Limited impacts to fish and wildlife have also been attributed to guidebook information.
CURRENT USAGE	Low.
COST RANGE	Low. Once produced, the cost of using a guidebook is low. However, the initial cost to research, write, edit and print a guidebook can be high.
PERSONNEL TIME	Low. Similar to the cost range, use of a guidebook requires little personnel time. However, initial development and publishing of a guidebook can require 2 to 3 years. If the guidebook encompasses a large volume of information, than managers may choose to contract an outside recreation organization or individual to produce the guidebook instead of using agency personnel time.
ADVANTAGES	Guidebooks are portable and can be carried into the backcountry. Useful during the planning stages of a trip. Covers many Wilderness topics in detail.
DISADVANTAGES	Requires continual updates and revisions. Extra expense to visitor. Primarily a route finding guide. Too comprehensive for visitor to absorb.
PRODUCTION	Guidebooks are produced in response to a need perceived by managers, information personnel and other outdoor recreation organizations. Producing a guidebook can take a fair amount of time researching the facts, writing the text, designing the layout and printing the final copy. Depending on the size of the guidebook, managers may work with the central agency office by supplying the details and having them produce the final guidebook. Some agencies work with large outdoor recreation organizations who can spend time developing and periodically updating an extensive guidebook.
MAINTENANCE	Guidebooks become outdated quickly because of changes in the trail system and regulations. Periodic updating and reprinting is necessary.

TIPS

Guidebooks should be easy to understand, concise and simple. Quality graphics, an attractive layout and a professional presentation are all assets. Topographical maps with accurate trail information, campsite locations and regulatory zones are a good supplement. Produce copies based on need, to reduce wasted expense. Guidebooks should be made available to recreationists both in advance of their trip and near the Wilderness area described.

Displays at Trailheads

MEDIA-BASED TECHNIQUE

DESCRIPTION	Displays located at Wilderness trailheads that provide backcountry information such as the location of designated campsites and regulatory zones, a brief review of minimum impact techniques and other management messages. Cases are often made of wood, metal, plastic or fiberglass with a glass or plexiglass cover to protect display materials, yet can be removed to change the posted material. Trailhead displays incorporate other I&E techniques such as maps, posters, brochures and postings of periodical articles.
EFFECTIVENESS	Low to moderate. Displays at trailheads are used to convey minimum impact camping messages and have been moderately effective in limiting trail and campsite deterioration, packstock damage, water contamination and most of all, human waste problems. Litter has also been effectively dealt with by displaying simple messages and illustration regarding carry-in/carry-out practices. Multi-paneled Kiosks are effective in separating and emphasizing specific messages.
CURRENT USAGE	High.
COST RANGE	Low to moderate. Initial cost of materials and construction can be moderate, but the cost is low once the display is in place. Much of the cost is absorbed during the production of other I&E techniques such as creating and printing posters, brochures and maps.
PERSONNEL TIME	Low to moderate. Personnel time is put into construction of the display cases or boards, if necessary, and gathering the information to put into the display. Additional time is required to maintain and update the posted information. This task is often performed by trailhead and backcountry personnel.
ADVANTAGES	Consistent, easily updated information. Reinforces messages before visitor enters Wilderness. Permanent, weather resistant display space. Can be visually attractive.
DISADVANTAGES	Possibly too late in visitors' backcountry travel plans to modify inappropriate behavior. Can be too much information at once if text is not kept simple and concise. Impersonal and may not attract visitors' interest. Often, visitors are eager to "hit the trail" and do not want to stop and read an entire display. No immediate feedback mechanism exists to explain confusing messages.
PRODUCTION	First, managers and field personnel must decide which trailheads should have high quality display space, based on the amount of visitor use and potential impacts to the resource from that portal. That evaluation will also help decide what information should be displayed. Use posters, maps, brochures and if necessary, articles to develop a trailhead display.
MAINTENANCE	Generally just periodic cleaning, repairing and updating.

TIPS

Keep messages simple and concise. Use photographs and creative illustrations to demonstrate the desired message. Reduce maintenance by using wood, metal, plastic or fiberglass to construct display case or board. Be sure to keep the posted information current. Design and arrange the display so that it will attract and hold the attention of visitors' passing by.

Displays at Agency Offices

MEDIA-BASED TECHNIQUE

DESCRIPTION	Semi or fully permanent information displays that often include simple poster arrangements, bulletin board postings of articles and agency announcements, topographical maps and sometimes, three dimensional models. The central focus of most agency office displays is to inform and educate visitors about minimum impact camping techniques, Wilderness regulations and current backcountry information. Other I&E techniques such as posters, maps, brochures and postings of periodical articles often makeup displays at agency offices.
EFFECTIVENESS	Low to moderate. Displaying posters that promote the "carry-in/carry-out" campaign at agency offices has been moderately effective in minimizing litter in the backcountry. Articles, brochures and posters that describe how to properly dispose of human waste have been moderately effective as well.
CURRENT USAGE	Moderate.
COST RANGE	Low. Much of the cost is absorbed during the production of other I&E techniques such as posters, brochures and maps. Unless original displays are constructed for the agency office, most of the cost is in personnel salary time required to arrange the materials, post and periodically update the information. Purchasing or building bulletin boards, easels, and permanent display cases or panels can be a moderate cost.
PERSONNEL TIME	Low. Time is required to arrange the materials, post and periodically update the information. Development of a permanent display can require a moderate amount of time. These tasks are usually performed by agency office personnel in consultation with field personnel.
ADVANTAGES	Provides information to visitors before and after their trip into the backcountry. If encouraged by personnel or an attractive display, visitors are willing to spend time reading and looking for special notices. Can be supplemented with agency personnel contact. Displays provide consistent information.
DISADVANTAGES	Possibly too late in visitors' backcountry travel plans to modify inappropriate behavior. Can be too much information at once and will be ignored if text is not kept simple and concise. Potentially too much information and will be ignored.
PRODUCTION	Simple or temporary displays are usually developed in-house and incorporate I&E media such as maps, brochures, posters and periodical articles. Managers draw upon the creative skills of information personnel that staff the particular agency office to produce the displays and organize bulletin board postings. Permanent or more involved displays can be produced at regional or central agency offices, or by contract with an outside organization.
MAINTENANCE	Periodic updating and cleaning.

TIPS

Keep amount of displayed information to a minimum. Bulletin boards, easels, display panels and cases should be organized, clean and up-to-date. Displays should be attractive and professional. Keep messages simple and concise. Use photographs and creative illustrations to demonstrate the desired message. Design and arrange the display so that it will attract and hold the attention of the visitors.

Displays at Visitor Centers

MEDIA-BASED TECHNIQUE

DESCRIPTION	Semi or fully permanent informational displays ranging from simple poster arrangements to 3-dimensional models. Visitor centers inform and educate visitors about the natural and cultural history of the area, as well as minimum impact camping techniques, travel routes, safety, regulations and Wilderness ethics. Informational displays are usually supplemented with personnel contact at information desks.
EFFECTIVENESS	Low to moderate. Displays at visitor centers have been moderately effective in controlling backcountry visitor overcrowding problems and, minimizing camping impacts such as campsite deterioration, human waste and litter. Displays that use preserved study skins and topographical models are effective in educating visitors about animal species life history and management objectives. This effort often results in decreased fish and wildlife impacts. Use of multi-paneled Kiosks are effective in separating and emphasizing specific messages.
CURRENT USAGE	Low.
COST RANGE	Low to moderate. Initial cost of materials and construction can be moderate, but the cost is low once the display is in place. Much of the cost is absorbed during the production of other I&E techniques such as creating and printing posters, brochures and maps. Cost can be moderate when original displays are constructed. Personnel salary time required to post and periodically update the information is a low cost spread over time. Purchasing or building bulletin boards, easels, permanent display cases or panels (kiosks) can be a moderate cost.
PERSONNEL TIME	Low. Development of a permanent display can require a moderate amount of time. Time is put into construction of the display cases or panels, if necessary, and gathering the information. Additional time is required to maintain and update the information. This task is performed by visitor center personnel in consultation with field personnel.
ADVANTAGES	Messages reach visitors that may or may not travel into the backcountry. Visitors are willing to spend time reading and learning at visitor centers. Display information is supplemented with personnel contact. Easy to maintain and update.
DISADVANTAGES	Can be too much information at once if text is not kept simple and concise. May not answer all visitor questions. Visitors may not be attentive when they read.
PRODUCTION	Simple or temporary displays are usually developed in-house and incorporate I&E media such as maps, brochures, posters and periodical articles. Once a message has been defined, managers draw upon the creative skills of information staff to produce the displays. Permanent or more involved displays can be produced at regional or central agency offices, or by contract with an outside organization.
MAINTENANCE	Periodic cleaning, repairing and updating.

TIPS

Keep the message simple and easy to read. The displays should be attractive and able to keep the readers' attention. Follow some order when displaying and telling a story about historical occurrences. Use photographs and creative illustrations to demonstrate the desired message. Visitors should feel they are being entertained and educated.

Movies

MEDIA-BASED TECHNIQUE

DESCRIPTION	Reel to reel films that are typically shown to general audiences at visitor centers, agency offices, and to school and recreational groups. Commercial movies can be borrowed, rented or purchased. Movies developed in-house are geared toward a particular Wilderness management problem.
EFFECTIVENESS	Low to moderate. Moderately to highly effective when discussing recreational impacts to fish and wildlife. Movies that address minimum impact camping techniques have been moderately effective in limiting trail deterioration, packstock damage, human waste, water contamination and in particular, campsite deterioration. Careless activities like littering and vandalism have been effectively decreased by the use of movies.
CURRENT USAGE	Low. Most use is in large, high use visitor centers and agency offices.
COST RANGE	Low. Potentially a high cost if the movie is produced in-house. Cooperative ventures with colleges and non-profit recreation organizations can reduce the cost of producing a high-quality, site specific movie. Most I&E personnel reduce costs by purchasing or renting relevant movies. Due to production expenses and operation convenience, videos are replacing movies.
PERSONNEL TIME	Low. Most of the personnel time is required to locate and order the desired movie. If the movie is developed and produced in-house, a great deal of personnel time (possibly 2 to 3 years) will be required to develop and produce the film.
ADVANTAGES	Movies are attractive and familiar. Using motion picture and sound, concepts can be expressed clearly. Portable and can be shown at such places as schools, public meetings, scheduled clinics and as evening programs. If accompanied by personnel, a feedback mechanism is in place to answer questions.
DISADVANTAGES	Requires too much time for visitors heading into the backcountry. In-house production may be too involved. A rented movie may not be relevant to site-specific conditions. Can become outdated quickly.
PRODUCTION	Movies are usually produced by commercial firms or by specialized departments of larger agencies and organizations. When information personnel decide that a movie is needed, they typically borrow, rent or purchase an existing film. Most agency offices do not have the facility to produce a movie.
MAINTENANCE	Periodic equipment cleaning, film splicing and storage.
TIPS	Length should be determined by the amount of time your target audience is willing to spend watching a movie. Backcountry visitors prefer short movies (5-10 minutes), whereas frontcountry visitors are willing to sit through a longer (15-30 minutes), more detailed presentation. Movies should be considered a supplement to, rather than a replacement for Wilderness information presentations.

Videos

MEDIA-BASED TECHNIQUE

DESCRIPTION	Similar to movies, but with advancements in VHS and Beta video technology, in-house development of an information video is easier and less expensive than reel to reel films. Short, five minute videos, developed in-house for a site specific problem are shown to visitors at agency offices and visitor centers before they enter the Wilderness. Longer, more involved videos are shown to general audiences at visitor centers, agency offices, and to school and recreational groups. Commercial videos can be borrowed, rented or purchased.
EFFECTIVENESS	Low to moderate. Moderately effective when discussing recreational impacts to fish and wildlife. Videos that address minimum impact camping techniques have been moderately effective in limiting trail and campsite deterioration, packstock damage, human waste problems and water contamination. Careless activities like littering and vandalism have been effectively decreased by the use of videos. Many managers feel that the potential of videos is not being maximized.
CURRENT USAGE	Low.
COST RANGE	Low. Potentially a moderate cost if the video is produced in-house. However, once the recording equipment is purchased (camera, television, video cassette recorder) the cost decreases substantially for the next videos. Cooperative ventures with colleges and non-profit recreation organizations can reduce the cost of producing a high-quality, site specific video. Some I&E personnel reduce costs by purchasing or renting relevant videos.
PERSONNEL TIME	Low. If the video is developed and produced in-house, a moderate amount of personnel time will be required. Personnel time is required to locate and order the desired video.
ADVANTAGES	Attractive and familiar. Using motion picture and sound, concepts can be expressed clearly. Portable and can be shown at such places as schools, public meetings, scheduled clinics and as evening programs. Copying of videos, if they are not copy righted, is relatively simple. If accompanied by personnel, a feedback mechanism is in place to answer questions.
DISADVANTAGES	Requires too much time for visitors heading into the backcountry. In-house production may be too involved. A rented or borrowed video may not be relevant to site-specific conditions. Can become outdated quickly.
PRODUCTION	Once managers and information personnel decide a video is needed and the equipment is available, they can produce a site-specific show. Be sure the objectives of the video are well defined and the script is written concisely. The video should be informative as well as entertaining. Keep the length of the video short (3 - 5 minutes) if it is intended for visitors before they enter the Wilderness at agency offices and visitor centers. Videos can be produced by commercial firms or by specialized departments of larger agencies and organizations. Occasionally, when information personnel decide that a video is needed, they borrow, rent or purchase an existing video.

MAINTENANCE	Periodic cleaning of video equipment and storage.
TIPS	Video equipment is widely available and can be used to supplement public presentations. Length of video should be determined by the amount of time your target audience is willing to commit. Encourage or require visitors to watch the video before they head into the backcountry. Videos should be considered a supplement to, rather than a replacement for Wilderness information presentations.
AVAILABLE VIDEOS	No Trace Backpacking (17:00 min.) Techniques & Equipment for Wilderness Horse Camping (12:30 min) USDA Forest Service, Technology and Development Center Ft. Missoula, Building #1, Missoula, MT 59801 Visions of the Wild (23:15 min.) USFS Washington Office and Pacific Southwest Region Re: Diner and Allied Film and Video 620 3rd St., San Francisco, CA 94107

Commercial Television

MEDIA-BASED TECHNIQUE

DESCRIPTION	Commercial television can be utilized best through news broadcasts, public service announcements and guest appearances on talk shows. Most television material is sent to local stations, which may have relatively small audiences in rural areas. Television messages also target urban communities where Wilderness visitors may reside.
EFFECTIVENESS	Low to Moderate. Television announcements and programs that explain proper minimum impact camping techniques have been moderately effective in decreasing campsite and trail deterioration, packstock damage and in particular, littering. Television has also been moderately effective in minimizing user conflict.
CURRENT USAGE	Rare. Managers feel this is the most neglected technique.
COST RANGE	Low. Personnel salary for developing public service announcements. Few managers and I&E personnel spend time developing television shows, therefore not much information exists about the cost of such a production.
PERSONNEL TIME	Low. Time required to prepare for television appearances and to develop public service announcements.
ADVANTAGES	Familiar information medium for visitors. Reaches a wide audience before a Wilderness visit, including children. Can target regional or local audiences.
DISADVANTAGES	Usually limited amount of time available to relate message effectively. Minimal control over timing of broadcast. May miss target audience.
PRODUCTION	Public service announcements can be produced to address site-specific problems at the local level or attained through regional and central agency offices. These announcements are sent to the appropriate television stations. I&E staff may have the opportunity to discuss backcountry issues on established programs such as weekly or nightly talk shows. Such appearances require background preparation, the ability to speak clearly and a good television presence. Notifying news reporters about agency events can get television coverage. Creating and writing a television spot requires more staff time, good communication skills, visual sensitivity and, if a commercial consultant is hired, a healthy budget.
MAINTENANCE	Not applicable.
TIPS	Be well prepared to respond concisely and thoroughly on talk shows. Use props such as slides, displays and equipment to emphasize the message. For public service announcements, choose television stations that reach your target audience. Messages should be concise and the presentation should take advantage of the visual nature of the medium. Once a contact is established, try to maintain a solid working relationship with the television station(s).

Slide Shows

MEDIA-BASED TECHNIQUE

DESCRIPTION	Short viewer-activated programs (5-10 minutes) shown at agency offices and visitor centers before Wilderness visitors head into the backcountry. Longer slide shows (15-30 minutes) addressing more conceptual elements of a topic, are often regularly scheduled throughout the day. Most shows are accompanied by a live or recorded narrative. Slide shows are often developed in-house and address topics specific to the local Wilderness.
EFFECTIVENESS	Moderate. Overall, managers feel slide shows are the most effective media-based I&E technique. Slide shows are moderately to highly effective in minimizing campsite and trail deterioration, packstock damage, improper disposal of human waste, water contamination and litter. Shows that describe the various camping opportunities in Wilderness have been effective in limiting overcrowding and user conflict. Vandalism has been moderately decreased as well due to slide shows.
CURRENT USAGE	Moderate.
COST RANGE	Low to moderate. Initial cost of slide projection equipment can be moderate. However, once attained the cost decreases. A commercially produced slide show can be moderate to high in cost.
PERSONNEL TIME	Low to moderate. If the show is developed and produced in-house, a moderate amount of personnel time will be required. I&E staff must design the program, write the script, shoot new pictures or use existing ones and develop the final show. Personnel time also is required to locate and order a commercial slide show, if that is the choice.
ADVANTAGES	Strong visual impact. Easy to operate and update. Illustrates point effectively at a relatively low cost and without going outdoors. Short programs can be viewer-activated.
DISADVANTAGES	May not reach target audience. If no information personnel are available, questions can be left unanswered.
PRODUCTION	Occasionally, I&E staffs acquire high quality, relevant slide shows that have been produced either commercially or by a central agency office. However, most slide shows are produced in-house, requiring personnel with good photographic and writing skills. Maintaining files of photos in storage helps to produce a show more quickly. Narration should be read by skilled personnel or by a professional announcer. Most I&E staff have the talent to produce a high quality slide show.
MAINTENANCE	Equipment cleaning and repair. Slide preservation and storage.
TIPS	Use high quality slides and recordings. Scripts should be positive, simple and direct. Make an entertaining show that includes both dramatic and humorous moments. Avoid a self-righteous tone in the narrative. Make a daily check of viewer-activated slide presentations to insure quality. Encourage or require visitors to watch the slide show before they head into the backcountry.

AVAILABLE SHOWS

Without a Trace: The Wilderness Challenge (23:00 min.)
Pacific Northwest Region
Re: Bill Stevens, 1501 SW Jefferson, Portland, OR 97201

Commercial Radio

MEDIA-BASED TECHNIQUE

DESCRIPTION	Short public service announcements, usually lasting less than a minute, or guest appearances on question and answer talk shows during local commercial radio broadcasts. Talk shows are typically longer and are either live or pre-taped.
EFFECTIVENESS	Low. Commercial radio broadcasts have not been terribly effective in relating Wilderness backcountry messages. This technique was the least effective of all the techniques examined in the study.
CURRENT USAGE	Low.
COST RANGE	Low. Staff salary time writing and recording short public service announcements. Initial cost of recording equipment may be moderate.
PERSONNEL TIME	Low. Preparation time for talk show interviews and production of public service announcements.
ADVANTAGES	Messages reach large populations of "unexpecting" current and potential visitors. Information aired can be changed as needed. Talk show interviews allow for in-depth discussions and can attract and hold a listener's attention. Generally a low cost technique.
DISADVANTAGES	Target audience may be missed. Limited control over timing of public service announcements. Short announcements can be misinterpreted. No concrete reminders of program's message.
PRODUCTION	The skills needed to write or record a short radio message are available on most I&E staffs. These generally include the ability to write well and read aloud clearly. Central agency offices often provide short pre-recorded public service announcements for the agency offices. However, most I&E staff write their own, site-specific announcements and send them to commercial radio stations for airing. To appear on a talk show, a manager should be knowledgeable in the topic of conversation and be articulate in presentation. A few hours of preparation before appearing on a talk show is advantageous.
MAINTENANCE	Periodic cleaning of recording equipment.
TIPS	When writing a short public service announcement, be sure the message is simple and concise. Be well prepared to respond during talk show interviews. If possible, choose the commercial radio station that reaches your target audience, both locally and regionally. Maintain a good working relationship with the radio station personnel. Send the talk show host an information package well in advance of your appearance. If possible, schedule programs when it is most effective, such as during rush hour or just before weekends.

Agency Radio

MEDIA-BASE TECHNIQUE

DESCRIPTION	Scheduled announcements and continuous daily information transmitted on AM frequency by an agency office or visitor center. Continuous messages are typically geared toward backcountry information such as trail conditions, local weather and permit availability.
EFFECTIVENESS	Low to Moderate. Agency radio broadcasts have been moderately effective in preventing overcrowding and user conflicts in Wilderness areas. In addition, broadcasts discussing minimum impact camping techniques have been moderately effective in dealing with litter and human waste problems.
CURRENT USAGE	Rare. Agency radio is the least used I&E technique of all that were examined in this study.
COST RANGE	Low. Initial cost of an AM transmitter and recording equipment can be moderate to high. However, once installed, the cost of daily transmissions are low.
PERSONNEL TIME	Low. I&E staff time required to develop, revise and update agency radio programs and daily announcements.
ADVANTAGES	Visitors driving to a Wilderness area can tune in and get up-to-date information. Agency has control over scheduling and content of special programs and daily announcements. Easily revised and updated. Consistent information.
DISADVANTAGES	Visitors may ignore agency station or they may tune in and miss the information they need. Target audience may be missed. Short announcements can be misinterpreted.
PRODUCTION	The skills needed to write or record a short radio message are available on most I&E staffs. These generally include the ability to write well and read aloud clearly. Central agency offices often provide short pre-recorded announcements for the agency offices. However, most I&E staff write their own, site-specific announcements. Transmissions are usually continuous throughout the day. Messages about the backcountry should be updated as conditions change.
MAINTENANCE	Periodic cleaning and repair of recording equipment. No details were provided about scheduled maintenance of agency owned transmitters.
TIPS	Place signs along roads and freeways leading to the Wilderness area indicating at what AM frequency agency information is being broadcasted. Use high quality recordings of special programs and announcements. Keep messages simple and concise. Choose staff that are dynamic and articulate to read messages. Keep continuous messages up-to-date.

Computers

MEDIA-BASED TECHNIQUE

DESCRIPTION	Visitor-operated computer terminals located at agency offices, visitor centers and in-town retail stores that are programed to provide up-to-date backcountry information. This includes the classic keyboard/ monitor combination with screen commands and simple push button or touch-screen system organized by information categories. Automatic systems with continuous information scrolling down the computer screen are also used.
EFFECTIVENESS	Low. Computers are felt to be generally ineffective in dealing with any management problem presented in this study. However, managers argue that the use of computers as an information source has tremendous potential. It needs more time to be tested and modified before final judgement.
CURRENT USAGE	Low. Some respondents felt this technique is being neglected and should be considered more as an information source.
COST RANGE	Low to high. Cost of computer system and software can be moderate to high. The salary time required from I&E staff to customize the computer system, maintain it, and keep the information current can be moderate.
PERSONNEL TIME	Low to moderate. Personnel time required to design the computer software, update the information and maintain an operating system.
ADVANTAGES	Up-to-date accurate information available at agency offices and visitor centers before the visitor enters Wilderness area. Computers are becoming a familiar, attractive medium for obtaining information. Potential information source for visitors after regular office hours.
DISADVANTAGES	A limited number of visitors can use a computer at one time. Commonly criticized as impersonal. If no personnel are present, an immediate feedback mechanism is missing.
PRODUCTION	Managers and I&E staff must first decide if the computer system is the correct choice and how it will fit into an overall I&E program. Once the design of the system is determined, a computer and its software must be attained. Often a firm is hired to write the program for the display, in cooperation with the needs of the I&E staff. Computer terminals can be located in such places as office windows, as part of a display or at an information desk. The system must be kept up-to-date. Direct electronic linkage is possible between the computer and weather instruments.
MAINTENANCE	Periodic cleaning and repairing. Daily updating of information.
TIPS	Use as a supplement to, not a replacement for information personnel at busy agency offices and visitor centers. Make the computer system easy to use and understand. The less intimidating, the more effective. Consider placing the computer terminal in an agency office or visitor center window as an information source after regular business hours. Check computer daily to make sure it is operating correctly.

Personnel-based I&E Techniques

Personnel-based techniques are communication avenues in which interpersonal contact between agency staff and the visitor is the major component at such places as public meetings, schools, campgrounds, in the backcountry, etc. This section describes eight techniques in which skilled personnel are used to provide I&E for Wilderness visitors. The format of the descriptive categories are similar to the previous media-based section. However, to accommodate the differences between media and personnel-based techniques, the production and maintenance categories have been replaced with a category on personnel training.

Personnel at Agency Offices

DESCRIPTION	Receptionists that greet visitors, provide information and issue backcountry permits and clerical personnel that oversee the daily administrative operations of the agency office. These people are prepared to answer basic informational questions regarding the Wilderness area. More involved questions are often deferred to well informed staff personnel.
EFFECTIVENESS	Moderate. When describing minimum impact camping techniques, personnel at agency offices have been moderately effective in decreasing trail and campsite deterioration, packstock damage, human waste problems and water contamination. Fish and wildlife impacts have also been effectively decreased by personnel at agency offices. Oral communication with visitors has been moderately effective in limiting inappropriate behavior such as vandalism and littering. Agency office personnel that spend time describing the various areas to visit in the backcountry and issuing permits where necessary, have been most effective in decreasing overcrowding and user conflict.
CURRENT USAGE	High. Most, if not all, agency offices have receptionists and administrative support staff.
COST RANGE	Moderate to high. Salary for full-time agency office employees.
PERSONNEL TIME	Moderate to high. Usually full-time employees that spend each work day in the office completing administrative tasks as well as providing information to visitors at an information desk and over the telephone. The number of staff providing information to visitors may increase during peak use periods in the year.
ADVANTAGES	Agency offices are popular destinations before visitors enter the Wilderness. Only personal contact with visitor if no backcountry or trailhead personnel exist. An immediate feedback mechanism is present to clear up any questions a visitor might have regarding an I&E message.
DISADVANTAGES	Agency personnel are often not directly familiar with the Wilderness backcountry. Only personnel contact is with those people who visit the agency office. Providing Wilderness I&E is often not a primary responsibility of agency office personnel.
TRAINING	Personnel at agency offices are often trained on the job. After initial training, they are prepared to answer basic information questions regarding the Wilderness area such as trail conditions, regulatory and travel zones and current weather forecasts. If questions cannot be answered directly, the agency office personnel usually tell visitors where they can attain the requested information.
TIPS	Training of personnel at agency offices should stress the importance of good Wilderness I&E and their role in distributing information. Accurate and up-to-date information on backcountry conditions should be readily available at the agency office. Encourage or require agency office personnel to visit the Wilderness area at least once.

Personnel at Visitor Centers

DESCRIPTION	Information personnel that field a variety of questions ranging from local natural and cultural history to Wilderness backcountry information. Visitor center personnel are also responsible for issuing backcountry permits. Visitor centers are staffed with both permanent and seasonal personnel who often have strong communication skills.
EFFECTIVENESS	Moderate. Information provided by personnel at visitor centers that describes the alternative areas to travel and camp in the Wilderness has been moderately to highly effective in dealing with overcrowding and user conflict in the backcountry. When describing minimum impact camping techniques, personnel at visitor centers have been moderately effective in decreasing trail and campsite deterioration, packstock damage, human waste problems and water contamination. Fish and wildlife impacts have also been effectively decreased. Oral communication with visitors has been moderately effective in limiting inappropriate behavior such as vandalism and littering.
CURRENT USAGE	Moderate. Most, if not all, visitor centers have information personnel that provide backcountry information.
COST RANGE	Moderate to high. The cost of personnel at visitor centers increases during peak use times and includes wages, training and shelter for seasonal employees. Salary for full-time visitor center employees continues all year.
PERSONNEL TIME	Moderate to high. Visitor centers are staffed with a combination of permanent and seasonal personnel that provide information on the natural and cultural history of the area, distribute backcountry information and issue permits. Visitor personnel also produce and maintain information displays and provide ideas for other I&E techniques such as maps, brochures, guidebooks, posters and videos. The number of seasonal personnel fluctuates with the level of use throughout the year.
ADVANTAGES	Experienced personnel providing consistent information. Wilderness visitors can be checked before a trip for their planned route and backcountry knowledge. Information is easily updated. An immediate feedback mechanism is present to clear up any questions a visitor might have regarding an I&E message.
DISADVANTAGES	Wilderness visitors may bypass visitor centers or if not, they may ignore the information personnel. Hours of operation may be too short to catch late arriving and early departing recreationists.
TRAINING	Visitor center staff receive pre-season orientation focused on communication techniques and orientation to the Wilderness area. On-the-job training occurs if sufficient time is not available to offer a full training session during a busy season.

TIPS

Visitor center information personnel should be familiar with Wilderness regulations and backcountry minimum impact camping techniques. They should use displays and other I&E techniques such as maps and posters to help emphasize a message. Hospitable attitudes towards the visitors should be maintained at all times. Accurate and up-to-date Wilderness information on backcountry conditions should be readily available each day to visitor center information personnel.

Personnel at Trailheads

PERSONNEL-BASED TECHNIQUE

DESCRIPTION	Personnel located at Wilderness trailheads that provide backcountry information, such as current trail conditions and locations of campsite and regulatory zones. They also issue and check backcountry permits. During slow times of the day, trailhead personnel can perform other tasks such as trail patrol and maintenance and nature interpretation.
EFFECTIVENESS	Moderate. Information provided by trailhead personnel that describes alternative areas to travel and camp in the Wilderness has been moderately to highly effective in dealing with overcrowding and user conflict in the backcountry. When describing minimum impact camping techniques, trailhead personnel have been moderately effective in decreasing trail and campsite deterioration, packstock damage, human waste problems and water contamination. Fish and wildlife impacts have also been effectively decreased. Oral communication with visitors has been moderately effective in limiting vandalism and littering.
CURRENT USAGE	Moderate.
COST RANGE	Moderate. The cost of trailhead personnel increases during peak use seasons and includes wages, training and shelter. The cost of the overall I&E budget may be lower if trailhead personnel perform other duties during low use hours. The use of volunteers can decrease the cost.
PERSONNEL TIME	Moderate to high. Generally requires more than one seasonal employee to cover at least the main trailheads. They provide backcountry information such as trail and campsite conditions, minimum impact camping techniques and check permits. Trailhead personnel also maintain trailhead information displays. The number of seasonal personnel fluctuates with the level of use throughout the year. Well trained volunteers can cover trailheads missed by seasonal employees.
ADVANTAGES	A chance to emphasize I&E messages with personal contact with visitors before they enter the Wilderness. Visitor questions can be answered and plans changed if necessary. Visitors are left to enjoy the Wilderness after initial contact at the trailhead is made.
DISADVANTAGES	May be too late in trip planning to change behavior. Visitors entering the trail early or late in the day may not be contacted. There may be times when trailhead personnel sit idle.
TRAINING	Personnel at trailheads are likely to work without direct supervision, therefore on-the-job training is insufficient. Training sessions before the season begins include Wilderness area orientation, minimum impact camping training and philosophy, and training in communication techniques. In many cases, personnel are given the opportunity to become acquainted with the Wilderness by visiting the backcountry.

TIPS

Locate personnel at the main trailheads during the busy times to be most effective. Use visual aids such as maps and information displays to emphasize messages. Trailhead personnel should actively contact Wilderness visitors. Personnel should be well trained and familiar with minimum impact camping techniques. Accurate and up-to-date Wilderness information on backcountry conditions should be readily available each day to trailhead personnel. Use volunteers when possible. Cost effectiveness increases when volunteer hosts are used to inform Wilderness visitors at trailheads.

Personnel at Campgrounds

DESCRIPTION	Although campgrounds do not exist in Wilderness areas, personnel operating agency campgrounds often provide backcountry information and interpretive programs to Wilderness visitors.
EFFECTIVENESS	Moderate. Campground personnel have been moderate to highly effective in decreasing litter problems. Their discussions with visitors about alternative areas to travel and camp in the Wilderness have been moderately effective in dealing with overcrowding and user conflict in the backcountry. When describing minimum impact camping techniques, campground personnel have been moderately effective in decreasing trail and campsite deterioration, packstock damage, human waste problems and water contamination. Fish and wildlife impacts have also been effectively decreased.
CURRENT USAGE	Moderate.
COST RANGE	Low to moderate. The cost of campground personnel increases during peak use seasons and includes wages, training and shelter.
PERSONNEL TIME	Moderate. Generally requires more than one seasonal employee during peak use times of the year. The primary duties of campground personnel include fee collection, control of use and maintenance. They speak with many visitors and can provide backcountry information on trail and campsite conditions and address minimum impact techniques. However, many campground visitors are not interested in entering the Wilderness backcountry. The number of seasonal campground personnel fluctuates with the level of use throughout the year.
ADVANTAGES	Often, time is available to discuss Wilderness topics in-depth. Personnel are usually available at earlier and later times of the day, when other information centers are closed or not occupied.
DISADVANTAGES	Providing Wilderness I&E is not a primary duty of campground personnel. Many campground visitors do not use the Wilderness backcountry.
TRAINING	A formal pre-season training session often includes Wilderness area orientation, minimum impact camping training and philosophy, and training in communication techniques. Campground personnel should be given the opportunity to become acquainted with the local Wilderness by visiting the backcountry.
TIPS	In areas where visitors seek backcountry information from campground personnel, training should include Wilderness I&E. Accurate and up-to-date information on backcountry conditions should be readily available each day to campground personnel.

Personnel at Public Meetings

PERSONNEL-BASED TECHNIQUE

DESCRIPTION	Agency personnel that attend planning and public policy meetings to speak on federal land management issues. Justification for Wilderness management decisions often include valuable I&E messages.
EFFECTIVENESS	Moderate. Agency personnel that attend public meetings have been moderately to highly effective in limiting user conflicts in the Wilderness backcountry and decreasing fish and wildlife impacts. They have also been moderately effective in decreasing inappropriate behavior such as littering and vandalism. Presentations to the public about alternative areas to travel and camp has been moderately effective in dealing with overcrowding in the backcountry. Public meetings also offer the opportunity to describe minimum impact camping techniques and can be moderately effective in decreasing trail and campsite deterioration, packstock damage, human waste disposal problems and water contamination.
CURRENT USAGE	Moderate.
COST RANGE	Low to moderate. Most of the cost is in preparation time and travel.
PERSONNEL TIME	Low to moderate. Agency managers and upper level information personnel usually attend public meetings. Their time is spent preparing materials and attending the meetings.
ADVANTAGES	Captive and usually interested audience. Good time for agency personnel to get feedback from public. More people can be reached than in a one-on-one situation. Topics can be discussed in-depth.
DISADVANTAGES	People that attend public meetings often do not cause problems in the Wilderness. May not be target audience.
TRAINING	Personnel representing their agency at public meetings are usually upper level managers or information personnel who are experienced and knowledgeable in their field. They should be given training opportunities to improve their speaking style and review effective use of visual aids.
TIPS	Visual aids such as slides, posters, wildlife specimens, equipment or I&E material enhance presentations. The agency representative should be articulate, well prepared to speak and answer questions and a good debate moderator. Personnel should seek for opportunities to educate Wilderness visitors about backcountry skills, ethics and safety.

Personnel at School Programs

PERSONNEL-BASED TECHNIQUE

DESCRIPTION	Seminars and programs for elementary, middle and high schools and college students that address topics such as minimum impact camping techniques, backcountry safety and Wilderness ethics. Programs vary in length from monthly 2-3 hour seminars to a single one hour presentation. The program can take place "in town" at the schools and colleges or can be given at the Wilderness area. Personnel leading or teaching these programs may be agency interpreters, information officers, volunteers or even backcountry rangers. Use existing school programs that are adaptable to most areas or develop site-specific programs in-house.
EFFECTIVENESS	Moderate. By fostering an appreciation for Wilderness values, school programs have been moderately to highly effective in decreasing inappropriate behavior such as littering and vandalism. School programs that demonstrate and explain minimum impact camping techniques have been effective in decreasing campsite and trail deterioration, packstock damage, water contamination and improper disposal of human waste. Programs that describe habitat requirements and the regulations protecting wildlife have been moderately effective in decreasing impacts to fish and wildlife. User conflict and overcrowding have also been effectively dealt with through school seminars and programs.
CURRENT USAGE	Moderate. Of the I&E techniques examined in this catalog, personnel at school programs is the only one that significantly increased in use over the past ten years.
COST RANGE	Low to moderate. The cost of personnel producing and presenting a program is moderate. However, once a program has been used once, the cost decreases with the only costs being a brief preparation time and the actual presentation. Using well trained volunteers can help reduce costs. Other costs could be any props and audio/visual aid equipment.
PERSONNEL TIME	Low to moderate. Personnel who lead or present school programs may be interpreters, information personnel and even backcountry personnel. Teachers and outdoor educators also help with agency school programs. A low to moderate amount of time is needed to produce, rehearse and present a quality school program. However, once a program has been used, the time required to prepare for the program decreases. Use of existing programs and skits decreases the time required to create and produce an in-house program.
ADVANTAGES	Wilderness I&E messages reach large numbers of children and young people as well as adults that participate in specialized outdoor recreation groups. Plenty of time to spend discussing the various topics in-depth. Fosters an overall environmental concern outside of the Wilderness, in every day life.
DISADVANTAGES	People receiving the message may never visit a Wilderness area.
TRAINING	The personnel who run seminars and school programs are usually skilled and experienced professionals that require no specialized training for producing these programs. Any seasonal personnel or volunteers that assist in the program may require some training in speaking and acting.

TIPS

Personnel presenting the school program or seminar should be skilled and experienced professionals. Use visual aids, demonstrations, field trips and involve the students when possible to help emphasize the message. Program material should be geared toward the level of audience understanding. Divide large classes into smaller groups and rotate them through program activities. Use existing programs that have been tested and proven successful. Positive results from programs materialize over longer periods of time.

AVAILABLE PROGRAMS

The Impact Monster
USDA Forest Service, Tonto National Forest, Mesa RD
P.O. Box 5800, Mesa, AZ 85211

Leave No Trace
USDA Forest Service, Intermountain Region
Federal Building, 324 25th St., Ogden, UT 84401

NOLS Conservation Practices
National Outdoor Leadership School
P.O. Box AA, Lander, WY 82520

Project Learning Tree
1250 Connecticut Avenue NW, Suite 320
Washington, DC 20036

Project Wild
Western Regional Environmental Education Council
P.O. Box 18060, Boulder, CO

Personnel in the Backcountry

PERSONNEL-BASED TECHNIQUE

DESCRIPTION	Seasonal or full-time personnel that regularly travel through the Wilderness backcountry performing duties such as enforcing regulations, monitoring trail and campsite conditions, collecting and packing out litter, checking visitor backcountry permits and assisting with search and rescue efforts. Backcountry personnel are often in contact with Wilderness visitors and can take that opportunity to inform and educate them, on site, about minimum impact camping techniques, backcountry safety and wilderness ethics.
EFFECTIVENESS	Moderate to high. Personnel in the backcountry was rated the most effective I&E technique available for educating Wilderness visitors. By camping and traveling in the Wilderness, backcountry personnel contact visitors, on site, to discuss and demonstrate minimum impact camping techniques and appropriate behavior. Backcountry personnel have been moderately to highly effective in decreasing overcrowding and user conflicts. The presence alone, of agency personnel in the backcountry, prompts visitors to be careful about inappropriate behavior such as littering and vandalism. Visitor campsites and travel patterns can be evaluated in the backcountry and can be corrected or commended as necessary. This practice has helped decrease campsite and trail deterioration, packstock damage, water contamination and improper disposal of human waste. Visitors are more open to discussion once in the backcountry. This enables backcountry personnel to explain habitat needs for local fish and wildlife and open a general discussion on Wilderness ethics.
CURRENT USAGE	High.
COST RANGE	Moderate to high. Most backcountry personnel are seasonal employees. The combined cost of training and paying their wages can be quite high. A respondent to the written questionnaire budgeted over $100,000.00 for backcountry personnel in one fiscal year.
PERSONNEL TIME	Moderate to high. Most backcountry personnel are seasonal employees that spend approximately 90% of their time in the backcountry or at trailheads. Occasionally, backcountry personnel spend a couple days at a time providing information at visitor centers. They also assist with school programs periodically.
ADVANTAGES	Backcountry personnel travel as Wilderness visitors do, adding to their credibility. Can keep up-to-date records on the conditions of trails and campsites. Visitors have time to stop, talk and think. Violators can be shown proper minimum impact camping techniques on-site and can carry the lesson into the planning of a future Wilderness trip.
DISADVANTAGES	Cost per visitor contact is high. Backcountry personnel can be viewed as obtrusive to the visitor's Wilderness experience.
TRAINING	Backcountry personnel should receive formal training that includes communication techniques, regulation enforcement, agency orientation, and special seminars on backcountry travel. Initially, new personnel should receive on-the-job training in the backcountry.

TIPS

Backcountry personnel should be friendly, confident working alone, physically fit, have excellent backcountry skills and knowledgeable in first aid. Develop a daily work schedule to give structure to the patrol. Concentrate on low-key, friendly visitor contacts and avoid a self-righteous attitude. Consider rotating frontcountry and backcountry personnel to keep them informed of current events and for a change of pace.

Interpreters

PERSONNEL-BASED TECHNIQUE

DESCRIPTION	Interpreters educate visitors in a variety of ways by providing general information, leading natural and cultural history walks, developing school and evening programs and creating displays. Interpreters are often based at busy agency offices or visitor centers in both full-time and seasonal positions.
EFFECTIVENESS	Moderate to high. Interpreters are moderately to highly effective in dealing with most problems related to backcountry recreation. Interpreters usually initiate contact with visitors to discuss topics specific to Wilderness backcountry such as minimum impact camping techniques, backcountry safety and Wilderness ethics. This effort has been moderately to highly effective in decreasing overcrowding, user conflicts, campsite and trail deterioration, packstock damage, water contamination and improper disposal of human waste. Visitors are typically open to discussion with interpreters. This enables interpreters to foster an appreciation for Wilderness and eventually convince visitors to decrease inappropriate behavior such as littering and vandalism.
CURRENT USAGE	Low.
COST RANGE	Low to moderate. The cost for both full-time and seasonal interpreters includes salary and training sessions.
PERSONNEL TIME	Moderate. Interpreters are both seasonal and full-time employees. Their time is spent conducting walks, presenting school and evening programs, providing general information and developing displays. Interpreters are often called on to create text for posters, brochures, maps, slide shows and videos.
ADVANTAGES	Interpreters are knowledgeable and communicate well. Personal one-on-one interaction with visitors. Interpreters are able to discuss Wilderness topics in-depth.
DISADVANTAGES	Interpreter's primary target audience is the general public and not specifically backcountry visitors. Topics of discussion are more natural and cultural history oriented.
TRAINING	Persons hired as interpreters usually bring to the position a high level of communication skills and an interest in dealing with the public. Formal pre-season training sessions are held for less experienced interpreters and seasonal personnel. Training should include information about Wilderness backcountry policies and problems.
TIPS	Interpreters should be friendly, patient, enjoy working with people and able to communicate well. They should have or be trained to have a strong background in local natural and cultural history and good Wilderness recreation methods. Interpreters should have access to daily reports on backcountry conditions. Consider using interpreters at campgrounds to hold day and evening programs.

Innovative I&E Techniques

Innovative I&E techniques are creative ways to communicate Wilderness messages. They are typically used to supplement or improve upon the more "traditional" techniques presented above in response to specific management needs. The following section contains brief descriptions of innovative I&E techniques presented by questionnaire respondents.

Traveling Display/Exhibit that communicates Wilderness messages at major trade shows, conferences, shopping malls and state fairs. This technique is most effective when agency personnel are present to interpret the exhibit as people stop and want to talk one-on-one.

Self-guided trips via canoe, backpacking or with packhorses. Usually 2 to 5 days in length. Includes the use of a guidebook that explains travel routes and includes messages on Wilderness etiquette and ethics.

Cooperative Management Agreements with organized recreation groups such as environmental organizations, outdoor leadership schools, outfitters, guiding groups and outing clubs. These groups often receive training from agency personnel about proper Wilderness skills and then in turn teach the people on their trips. The groups can also participate in special work projects such as maintaining trails and removing man-made structures.

Agency Seminars that invite Agency or University professionals such as biologists, foresters, interpreters, rangers and administrators to present a seminar to Wilderness agency personnel. As a result, the frontline personnel who contact Wilderness visitors on a regular basis are then prepared to discuss current research and programs.

A **"Leave No Trace" Quiz** handed out at local fairs. The quiz asks approximately ten questions regarding minimum impact camping and backpacking in the Wilderness, then presents a selection of answers. If participants only miss two questions, they were rewarded with a poster. This technique was considered very effective to learn what messages needed emphasis.

A **Sample Campsite** display located at agency offices, visitor centers, trailheads, school programs and public meetings demonstrating minimum impact camping equipment and techniques is becoming quite popular. Often, a sample campsite is accompanied by a "how-not-to-do-it" campsite, complete with litter, human waste, tent trenches, etc. This technique is most effective when personnel are present to interpret the display and to let visitors handle and use the equipment. Use **Equipment Stores** as places to contact

potential Wilderness visitors when they purchase or browse for backpacking equipment. In many cases, equipment store employees are unskilled at providing good I&E, lack access to current information, and are too busy to focus on recreationists' needs. Wilderness managers can provide posters and displays that can be set up at entrances to equipment stores and near equipment that may be relevant to the message.

Correspondence with Wilderness visitors who write or call requesting information is another way to enhance the effectiveness of office or information personnel. Often, these potential visitors are unsettled with their plans and are particularly receptive to brochures and form letters. A personal note should be added to a reply to insure specific questions are answered. In addition, it is important to maintain a rapid turn-around time so that the visitor receives the information well in advance of their trip. Fazio and Ratcliffe (1989) concluded that answering mail inquires from the public has tremendous potential for helping managers to protect resources while at the same time helping visitors enjoy a safe and satisfying experience.

Letters of Commendation can be sent out to reward Wilderness visitors that practiced minimum impact camping techniques and that generally acted in good behavior. This reward is a positive message of assurance encourages the visitor behave the same on return to the Wilderness and may lead to an additional avenue of Wilderness education and advocacy. Backcountry rangers are most likely to observe visitor behavior in the Wilderness firsthand and can collect names and addresses for future contact.

Providing **Litterbags** to visitors entering the Wilderness solves the problem of how to carry out garbage, once visitors understand that it is the best thing to do. Asking visitors if they have a trash bag is an easy way to break the ice on the subject. Litterbags also provide a large surface area on which to print I&E messages.

Workshops offer instruction in backcountry skills such as minimum impact camping and backpacking, safety and rescue and winter camping. Instructors are skilled leaders drawn from agency personnel, outdoor organizations and volunteer contacts. Often, non-profit recreation organizations operate these type of workshops and charge a fee to the participants. Workshops are typically designed to teach novices and introduce them to backcountry travel. Beyond learning skills, participants develop a sense of aesthetics and a philosophy of minimum impact use.

Information & Education Program Evaluation

Managers agreed that it is important to periodically evaluate I&E programs to determine their effectiveness in dealing with backcountry problems. This is particularly true today, with existing budget constraints. The most common evaluations are informal reviews of personnel performance and preparation of media-based I&E materials. Visitor response as it relates to changes in the condition of the resource (i.e. trails, campsites, water quality) can be evaluated through informal observations made by backcountry personnel.
A more objective method is to test the visitors' response to your I&E program.

I&E programs are intended to reach management objectives that call for an increase in the visitor's awareness of minimum impact camping techniques and wilderness ethics, and to generate a positive attitude toward Wilderness values. By surveying visitor knowledge or testing their behavioral response after being subjected to an I&E program, managers can gauge the effectiveness of their efforts. For example, Oliver et al. (1985) found that by distributing a brochure on minimum impact camping techniques at the entrance of a campground in Virginia, tree vandalism and litter decreased by 50 percent. When the brochure was distributed to visitors through personnel contact, the impacts decreased by about 80 percent. This sort of information enables a manager to objectively evaluate their I&E program to maximize its effectiveness.

Appendices

Appendix A. Written Questionnaire

This questionnaire is designed to gather information on the Information and Education (I&E) techniques and programs you use to advocate low impact use of Wilderness land.

1. The following is a list of I&E techniques. On the right are three columns. If you do not use the technique, check off the box in the Not Used column. For each technique you currently use, estimate the number of person days worked per year and overall cost per year based on your best judgment and experience.

Technique	Not Used	Person Days/year	Cost ($)/year
Commercial periodicals	[ ]	[ ]	[ ]
Agency periodicals	[ ]	[ ]	[ ]
Brochures	[ ]	[ ]	[ ]
Maps	[ ]	[ ]	[ ]
Posters	[ ]	[ ]	[ ]
Signs	[ ]	[ ]	[ ]
Guidebooks	[ ]	[ ]	[ ]
Displays at trailheads	[ ]	[ ]	[ ]
Displays at agency offices	[ ]	[ ]	[ ]
Displays at visitor centers	[ ]	[ ]	[ ]
Movies	[ ]	[ ]	[ ]
Videos	[ ]	[ ]	[ ]
Commercial TV	[ ]	[ ]	[ ]
Slide shows	[ ]	[ ]	[ ]
Commercial radio	[ ]	[ ]	[ ]
Agency radio	[ ]	[ ]	[ ]
Computers	[ ]	[ ]	[ ]
Personnel at agency offices	[ ]	[ ]	[ ]
Personnel at visitor centers	[ ]	[ ]	[ ]
Personnel at trailheads	[ ]	[ ]	[ ]
Personnel at campgrounds	[ ]	[ ]	[ ]
Personnel at public meetings	[ ]	[ ]	[ ]
Personnel at school programs	[ ]	[ ]	[ ]
Personnel in the backcountry	[ ]	[ ]	[ ]
Interpreters	[ ]	[ ]	[ ]
Other (specify) _____	[ ]	[ ]	[ ]

We are also interested in identifying and learning about particularly innovative I&E programs.

3. Do you have an I&E program that you consider innovative?

[ ] Yes [ ] No

If yes, please describe briefly below.

4. Do you know of any innovative backcountry I&E programs run by state or local agencies or private organizations in your area?

[ ] Yes [ ] No

If yes, please list a name or agency or organization to enable us to learn about this program.

5. Are you familiar with any research work done on I&E programs in your area within the last five years?
[ ] Yes [ ] No

If yes, please list a name and affiliation that could help us learn more about this research.

6. We plan to follow up on this questionnaire with phone calls to ask more detailed questions about how to make the best use of specific I&E techniques and how to provide the best possible overall I&E program. Are you willing to be contacted by phone to provide some of this information?

[ ] Yes [ ] No

If yes, please list your commercial telephone number:_____

If no, please suggest name and address of a more appropriate contact.

7. How much acreage is the land in which you conduct I&E? _____

8. What is the name of the Wilderness area in which you conduct I&E?

Please return the completed questionnaire promptly in the enclosed self-addressed, stamped envelope. The Appalachian Mountain Club and the USDA Forest Service Intermountain Research Station are conducting this study and express appreciation for your time and effort.

Please write your name and address to the right:

Appendix B. Follow-up phone interview questions

Give a general **description** of _____ technique.

List some **advantages** of _____ technique.

List **disadvantages** of _____ technique.

What **maintenance** is required, if at all?

Any special **tips** that might be helpful?

What level of personnel **skills** are required?

At what **time** and **setting** is the technique most effective?

Have you **stopped** using any techniques?

Following questions are on your **overall** I&E program:

Do you **mix** techniques for an overall program? If so, How?

Do you **select** and **target** an audience? If so, how?

How do you **evaluate** the effectiveness of your program?

Any advice for working within a **tight I&E budget**?

Are you aware of any **sources** of information about the techniques you use?

Appendix C. **Annual Cost of I&E Techniques by Federal Agency**

Number of questionnaire respondents, by Federal Agency, that estimated their annual cost per technique within the indicated range (# respondents per cost range/# agency responses for that particular technique).

Cost/yr (by agency)

I&E Technique	Low ($0 - 500)				Moderate ($501 - 5,000)				High ($5,000 +)			
	BLM	NPS	FWS	USFS	BLM	NPS	FWS	USFS	BLM	NPS	USFWS	FS
Commercial Periodicals	0/1	2/2	1/1	15/16	1/1	0/2	0/1	1/16	0/1	0/2	0/1	0/16
Agency Periodicals	2/2	2/5	1/3	28/38	0/2	3/5	2/3	9/38	0/2	0/5	0/3	1/38
Brochures	5/10	10/16	8/17	119/152	3/10	5/16	7/17	32/152	2/10	1/16	2/17	1/152
Maps	6/9	7/10	8/13	100/145	2/9	2/10	5/13	42/145	1/9	1/10	0/13	3/145
Posters	1/2	6/6	2/3	92/114	1/2	0/6	1/3	22/114	0/2	0/6	0/3	0/114
Signs	2/6	6/10	6/14	85/145	4/6	3/10	7/14	52/145	0/6	1/10	1/14	3/145
Guidebooks	0	1/2	2/3	27/29	0	1/2	0/3	2/29	0	0/2	1/3	0/29
Displays at Trailheads	3/4	2/6	3/7	86/127	1/4	4/6	3/7	40/127	0/4	0/6	1/7	1/127
Displays at Agency Offices	2/4	5/7	5/7	97/108	2/4	2/7	2/7	10/108	0/4	0/7	0/7	1/108
Displays at Visitor Centers	1/1	8/10	3/5	21/30	0/1	2/10	2/5	9/30	0/1	0/10	0/5	0/30
Movies	0	1/1	1/2	14/16	0	0/1	1/2	2/16	0	0/1	0/2	0/16
Videos	0/1	3/6	3/3	38/44	1/1	2/6	0/3	6/44	0/1	1/6	0/3	0/44
Commercial TV	1/1	1/1	2/2	5/6	0/1	0/1	0/2	1/6	0/1	0/1	0/2	0/6
Slide Shows	3/7	3/8	7/9	59/71	4/7	5/8	2/9	11/71	0/7	0/8	0/9	1/71
Commercial Radio	0	1/1	1/1	0/20	0	0/1	0/1	18/20	0	0/1	0/1	2/20
Agency Radio	0	1/1	1/1	0/1	0	0/1	0/1	1/1	0	0/1	0/1	0/1
Computer	1/1	2/2	2/3	15/22	0/1	0/2	0/3	4/22	0/1	0/2	1/3	3/22
Personnel at Agency Offices	2/8	4/11	5/9	63/155	5/8	3/11	2/9	69/155	1/8	4/11	2/9	23/155
Personnel at Visitor Centers	0/5	3/15	3/7	13/42	4/5	6/15	1/7	18/42	1/5	6/15	3/7	11/92
Personnel at Trailheads	1/4	1/1	0/1	27/70	2/4	0/1	1/1	40/70	1/4	0/1	1/1	3/70
Personnel at Campgrounds	0/1	3/6	0	47/84	1/1	1/6	0	33/84	0/1	2/6	0	4/84
Personnel at Public Meetings	0/5	5/6	7/8	59/71	5/5	1/6	1/8	11/71	0/5	0/6	0/8	1/71
Personnel at School Programs	1/2	3/7	8/9	77/104	1/2	3/7	1/9	26/104	0/2	1/7	0/9	1/104
Personnel in the Backcountry	0/6	2/15	3/6	20/142	6/6	3/15	1/6	70/142	0/6	10/15	2/6	52/142
Interpreters	0/2	2/6	1/3	10/18	2/2	3/6	0/3	7/18	0/2	1/6	2/3	1/18

Appendix D. **Annual Personnel Time by Federal Agency**

Number of questionnaire respondents, by Federal Agency, that estimated the amount of time per year required to operate the I&E techniques within the indicated range (# respondents per time category/# agency responses for that particular technique).

Person days/yr (percent of respondents)

I&E Technique	Low (1 - 10 days/yr)				Moderate (11 - 90 days/yr)				High (> 90 + days/yr)			
	BLM	NPS	FWS	USFS	BLM	NPS	FWS	USFS	BLM	NPS	FWS	USFS
Commercial Periodicals	1/1	2/2	2/2	18/18	0/1	0/2	0/2	1/18	0/1	0/2	0/2	0/18
Agency Periodicals	3/3	2/4	3/3	36/38	0/3	2/4	0/3	1/38	0/3	0/4	0/3	1/38
Brochures	8/10	11/15	15/17	128/143	2/10	3/15	1/17	13/143	0/10	1/15	1/17	2/143
Maps	7/9	8/10	14/16	110/134	2/9	1/10	1/16	22/134	0/9	1/10	1/16	2/134
Posters	2/3	6/6	3/3	101/106	1/3	0/6	0/3	5/106	0/3	0/6	0/3	0/106
Signs	7/9	4/8	13/14	114/136	2/9	3/8	1/14	21/136	0/9	1/8	0/14	1/136
Guidebooks	1/1	1/2	1/2	28/28	0/1	1/2	0/1	0/28	0/1	0/2	1/2	0/28
Displays at Trailheads	6/6	6/7	8/8	104/119	0/6	1/7	0/8	14/119	0/6	0/7	0/8	1/119
Displays at Agency Offices	3/5	4/4	7/7	101/107	2/5	0/4	0/7	5/107	0/5	0/4	0/7	1/107
Displays at Visitor Centers	3/3	7/8	1/2	24/26	0/3	1/8	0/2	2/26	0/3	0/8	1/2	0/26
Movies	1/1	0	1/2	15/15	0/1	0	0/2	0/15	0/1	0	1/2	0/15
Videos	1/1	3/5	3/3	47/47	0/1	1/5	0/3	0/47	0/1	1/5	0/3	0/47
Commercial TV	1/1	1/1	3/3	6/6	0/1	0/1	0/3	0/6	0/1	0/1	0/3	0/6
Slide Shows	6/8	6/10	7/9	65/72	2/8	4/10	2/9	6/72	0/8	0/10	0/9	1/72
Commercial Radio	0	1/1	3/3	12/19	0	0/1	0/3	2/19	0	0/1	0/3	0/19
Agency Radio	0	1/1	0	1/1	0	0/1	0	0/1	0	0/1	0	0/1
Computer	1/2	1/1	2/3	17/22	1/2	0/1	0/3	3/22	0/2	0/1	1/3	2/22
Personnel at Agency Offices	7/9	5/12	8/12	84/155	2/9	4/12	2/12	56/155	0/9	3/12	2/12	15/155
Personnel at Visitor Centers	3/6	6/17	2/6	19/43	0/6	5/17	0/6	12/43	3/6	6/17	4/6	12/43
Personnel at Trailheads	0/3	1/1	0/1	42/74	2/3	0/1	0/1	28/74	1/3	0/1	1/1	4/74
Personnel at Campgrounds	1/2	3/6	0	49/85	0/2	3/6	0	29/85	1/2	0/6	0	7/85
Personnel at Public Meetings	3/6	6/6	6/9	68/74	3/6	0/6	3/9	5/74	0/6	0/6	0/9	1/74
Personnel at School Programs	2/3	6/7	8/10	89/103	1/3	0/7	2/10	14/103	0/3	1/7	0/10	0/103
Personnel in the Backcountry	4/7	2/16	3/6	30/145	1/7	6/16	2/6	69/145	1/7	8/16	1/6	46/145
Interpreters	0/1	5/10	0/2	11/18	1/1	3/10	0/2	5/18	0/1	2/10	2/2	2/18